Image by Delta Airport Consultants, Inc.

Chapter One

INTRODUCTION & EXISTING CONDITIONS

This Master Plan recommends airport development through 2036.

INTRODUCTION

The purpose of the Master Plan and Airport Layout Plan (ALP) for the Eastern West Virginia Regional Airport (MRB) is to provide the Eastern West Virginia Regional Airport Authority (EWVRAA), the City of Martinsburg, and Berkeley County with useful, understandable information and guidance in order to develop and maintain a safe and efficient airport. The ALP provides the Federal Aviation Administration (FAA), the West Virginia Aeronautics Commission (WVAC), the EWVRAA, and other key stakeholders with information concerning planned development at MRB.

This document presents the results of data collection, forecasts, an alternative development analysis, and recommendations for continued development of MRB through the year 2036. With the most recent Master Plan published in 1990 and the ALP updated in 2006, both FAA design standards and aircraft operations at MRB have changed which warrant a new Master Plan.

The Master Plan is developed in conformance with FAA guidelines for conducting airport master plans and was financed jointly by the FAA, WVAC, and the EWVRAA. It concentrates on assessing existing conditions as well as the future general aviation activity needs of MRB. This assessment, along with an inventory of existing conditions, serves as the foundation for analyzing future needs against the capacity of existing infrastructure to meet these needs. The Forecast of Aviation Demand (Chapter Two) examines the anticipated growth in aviation activity at MRB during the 20-year planning period while Facility Requirements (Chapter Three) compares existing facilities and capacities against the forecasted demand.

Chapter Four, Alternatives Analysis, presents and assesses alternative development concepts to accommodate the forecasted demand. Advantages and disadvantages, land requirements, and order of magnitude cost estimates for each alternative are presented along with a recommended preferred alternative for development.

Chapter Five, Airport Layout Plan, presents and discusses the ALP drawing set. These drawings graphically represent the existing conditions along with all planned airport improvements for MRB, including the preferred alternative for development, in the short term (0-5 years), intermediate term (6-10 years), and long term (11-20 years), as well as the Ulitmate Phase (beyond 20 years). The plan set satisfies federal guidelines for airport development identified in the FAA Advisory Circular (AC) 150/5300-13A, *Airport Design* (FAA AC-13A).

Chapter Six, Cost Estimates, presents a recommended, phased capital development program and provides a schedule of anticipated potential funding allocations from federal, state, local, and private sources.

In addition to the Master Plan narrative and accompanying ALP drawing set, the following on-airport studies and reports were completed during the planning effort. These documents are referenced throughout the Master Plan narrative and are included as appendices.

- Pavement Management Program Implementation
- Airfield Electrical Assessment
- Stormwater Management Study

Image by Delta Airport Consultants, Inc.

Section 1 - Airport Background

1.1 | Part 01 - Airport Location and Management

MRB is home to Shepherd Field Air National Guard Base

MRB is a general aviation reliever airport located approximately four miles south of the City of Martinsburg in Berkeley County, West Virginia. Western access to the airport is made via Interstate 81 and eastern access to the airport is made via West Virginia state highway Route 9. **Figure 1.1**, Airport Vicinity Map, identifies the airport location and surroundings.

Owned and operated by EWVRAA, the airport's largest tenant is the West Virginia Air National Guard and Shepherd Field Base. The Shepherd Field Base is situated on airport property and contains approximately 342 acres. The Air National Guard has had a continuous presence at the airport since 1955. The existing runway (Runway 8-26) and its parallel taxiway (Taxiway A) are designed to accommodate the critical aircraft based with the Air National Guard, which is the C-17 Globemaster III.

A full-time airport manager is appointed by the EWVRAA to oversee the day-to-day operations of the facility. A staff of two full-time employees provides the overall administrative, maintenance, and service functions for MRB.

The EWVRAA is comprised of 13 members who oversee matters pertaining to the airport. The EWVRAA membership consists of one member appointed by Jefferson County, six members appointed by the City of Martinsburg, and six members appointed by Berkeley County. Appointed members serve three-year terms.

AIRPORT VICINITY MAP

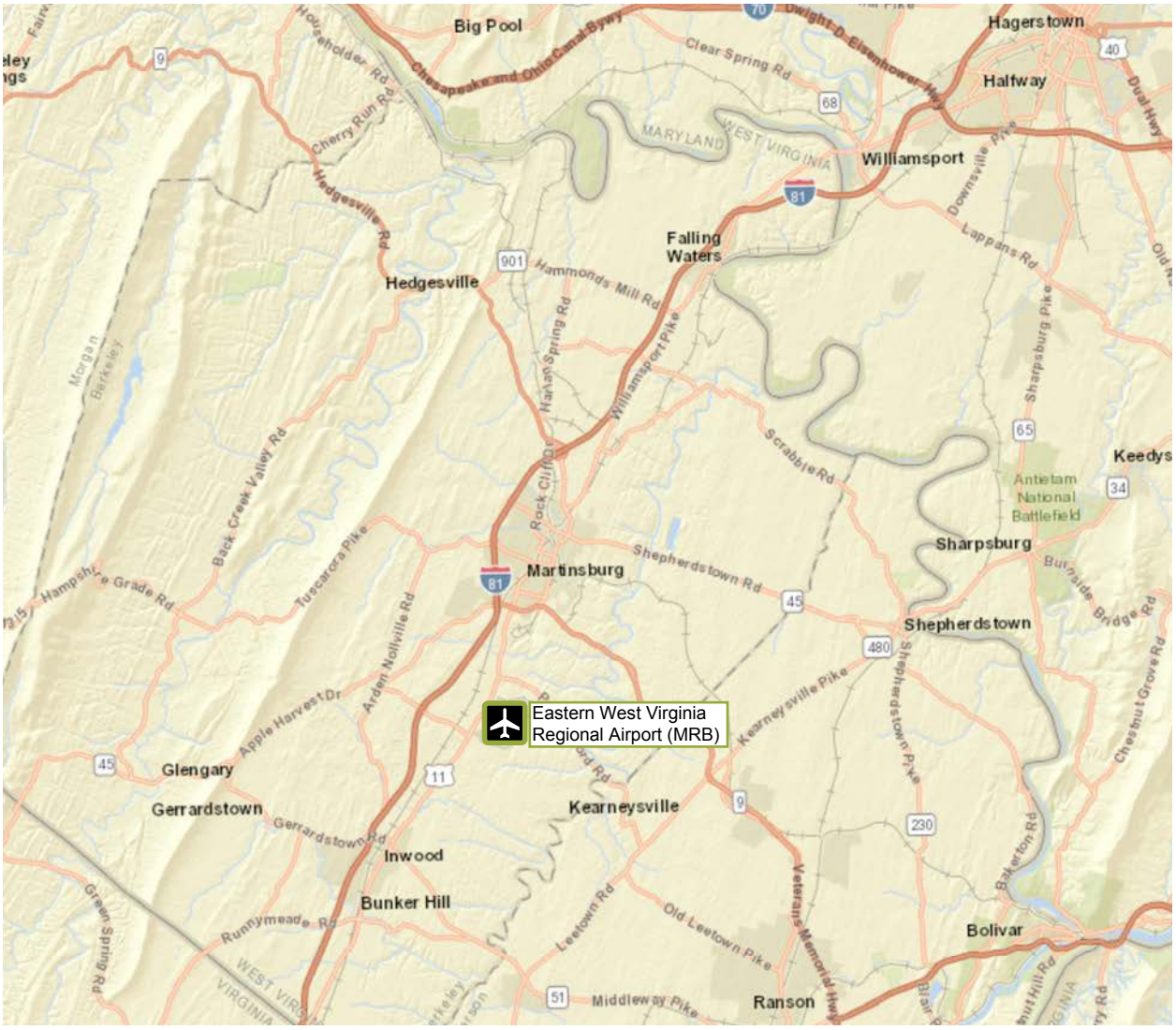

Figure 1.1- Airport Vicinity Map
Source: National Geographic, Esri, DeLorme, HERE, UNEP-WCNC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, Increment P. Corp.

1.1 | Part 02 - Airport History Timeline

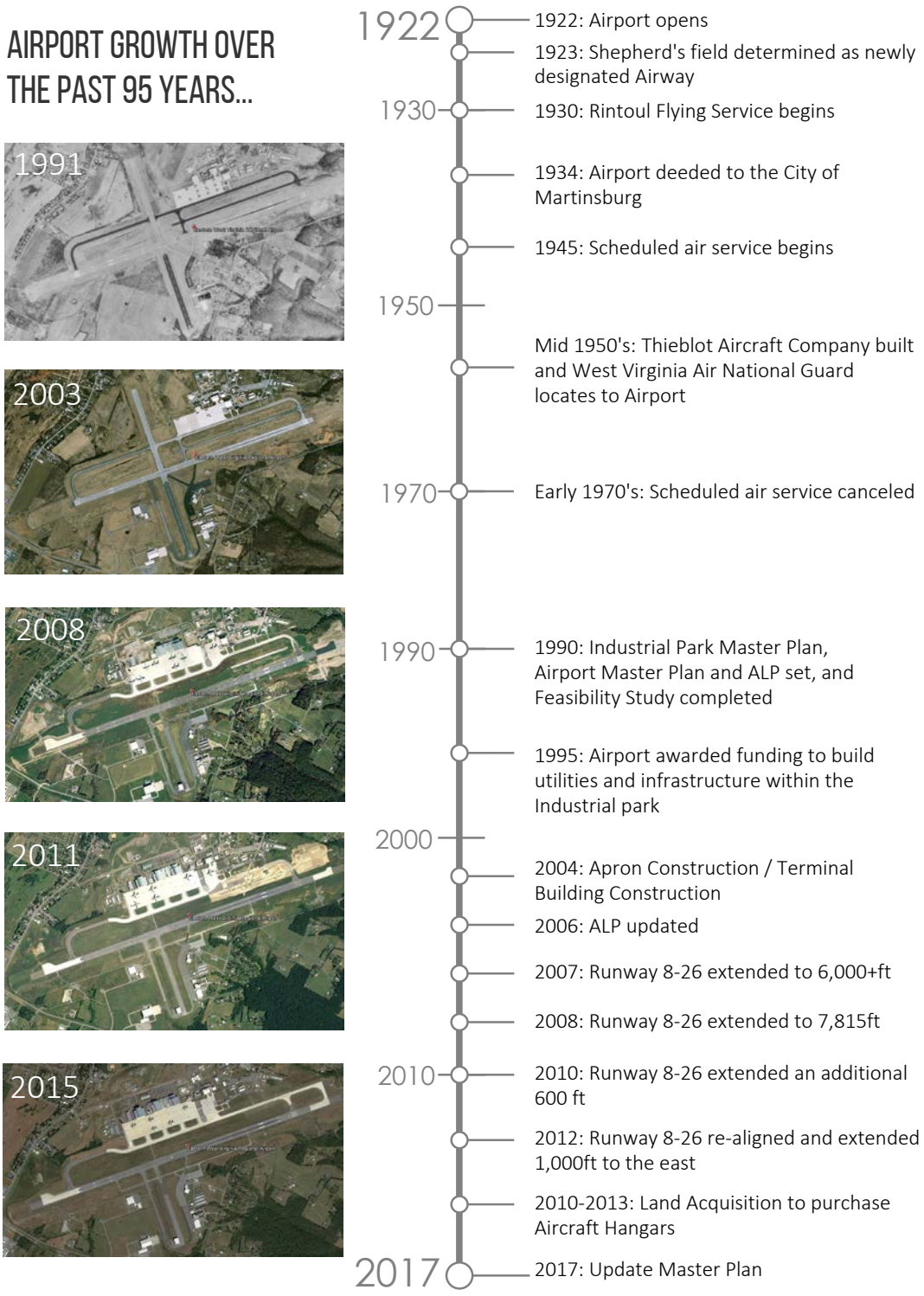

Figure 1.2- Airport History Timeline
Source: Images by Google Earth, Delta Airport Consultants, Inc.

1.1 | Part 03 - Project History

MRB has participated in the FAA's Airport Improvement Program (AIP) since 1976. This program currently funds 90 percent of AIP-eligible federal projects. MRB also participates in a state funding program offered through WVAC, which matches five percent of the remaining project cost that the AIP does not cover, and may provide funding for projects ineligible under the AIP. **Table 1.1** provides a listing of the federal grants that MRB has received since 1976; the table does not include a comprehensive list of federal investment by the U.S. Military on airfield-related projects.

Table 1.1- Grant History

YEAR	DESCRIPTION	AIP $ AMOUNT
1976	Install Partial Perimeter Fencing	$24,379
1980	Runway 8-26 – repair and reconstruct apron and taxiways	$130,878
1981	Repair and resurface Runway 17-35	$316,000
1983	Resurface, repair end of Runway 8 and resurface Taxiway D	$394,544
1983	Expand parking apron	$158,000
1985	Rehabilitate and strengthen Taxiway A	$695,930*
1989	New High Intensity Lighting Runway 8-26 to include regulators, control system, new vault	$567,058
1990	Airport Boundary Survey and 14,500-ft Perimeter Fencing	$230,000
1991	Airport Master Plan Update including a new ALP	$75,000
1991	New Medium Intensity Lighting for Runway 17-35, including new control regulators, ramp lighting, and Precision Approach Path Indicator (PAPI)	$218,130
1992	Rehabilitate Taxiways B and C lighting and engineering work for Taxiway A rehabilitation	$102,817
1993	Rehabilitate Taxiway A pavement	$262,529
1994	Rehabilitate Taxiway D lighting; new rotating beacon; wind cones and apron security lighting	$138,089
1995	Taxiway extension/utilities extension storm water provisions – water tower	$4,150,000
1996	Rehabilitate Apron and Seal Taxiways B, C, and D	$154,242

Table 1.1- Grant History

YEAR	DESCRIPTION	AIP $ AMOUNT
1997	Replace Taxiway Signs Phase I	$166,668
1998	Replace Taxiway Signs Phase II and acquire snow removal equipment	$222,223
1998	Rehabilitate Taxiway A pavement	$1,333,286
1997	Replace Taxiway Signs Phase I	$166,668
2000	Taxiway extension and perimeter fencing	$666,112
2001	Taxiway extension Phase II	$355,000
2002	General Aviation Master Plan; Environmental Assessment; Apron Design; and Terminal Design	$679,792
2003	Apron Construction/Terminal Building Construction	$1,044,444
2004	Design Taxiway E and Terminal Building Construction	$501,417
2006	Demolition of Old Terminal Building and Relocate Fuel Farm	$354,045
2007	Taxiway E Phase II and Updating Minimum Operation Standards and Rules and Regulations	$1,449,533
2008	Rehabilitate Taxiway T-hangar area and install new beacon	$563,055
2009	FAA Stimulus Project Construct Taxiway E Phase III	$647,660
2009	Rehabilitate General Aviation Apron	$503,000
2010	Noise Compatibility Study (for C-5 Galaxy)	$192,000
2010	Land Acquisition to Purchase Aircraft Hangars	$150,000
2011	Land Acquisition to Purchase Aircraft Hangars	$150,000
2012	Land Acquisition to Purchase Aircraft Hangars	$150,000
2013	Land Acquisition and Rehabilitate Taxiway C	$150,000
2014	Rehabilitate Taxiway B and additional South GA Ramp Pavement Improvements	$712,815
2017	Master Plan Update	$359,420

Source: FAA and Airport Records
* West Virginia Air National Guard contributed $34,797 to the project.

1.1 | Part 04 - Airport Role

Eastern West Virginia Regional Airport is classified in the NPIAS as a general aviation reliever airport

The 2017-2021 National Plan of Integrated Airport Systems (NPIAS) lists MRB as a reliever airport. The 2012 FAA Report, General Aviation Airports: A National Asset, identifies MRB as a reliever local airport.

The NPIAS contains 3,332 airports which are primarily grouped into two major categories: primary and non-primary. General aviation aircraft mainly use non-primary airports. The NPIAS identifies 2,950 non-primary airports and included in this category are commercial service, general aviation, and reliever airports. Approximately nine percent of the non-primary airports in the NPIAS are classified as a reliever.

Within the National Asset Report, non-primary airports are also grouped into five categories: national, regional, local, basic, and unclassified. Significant to the general aviation system, local airports provide communities access to both local and regional markers. Local airports account for 38 percent of all NPIAS airports.

UNDERSTANDING...AIRPORT CLASSIFICATIONS

Federal airport classifications are published within the National Plan of Integrated Airport Systems (NPIAS) as required by the Airport and Airways Improvement Act of 1982. This FAA planning document is updated biannually in an effort to identify the nation's airport needs over a 10-year planning period and classify airports based on their significance to the air transportation system.

Only those airports within the NPIAS are eligible to receive federal Airport Improvement Program (AIP) funding. As of February 2016, there are 5,136 public-use airports in the United States. Of these, 3,332 (65 percent) have been deemed significant to air transportation and have therefore been included in the NPIAS.

COMMERCIAL SERVICE – PRIMARY (P)
Airports that enplane less than 0.05 percent of commercial passenger enplanements but have more than 10,000 annual enplanements.

COMMERCIAL SERVICE – NON-PRIMARY (CS)
Airports that have between 2,500 and 10,000 annual passenger enplanements.

CARGO AIRPORT
Airports that, in addition to any other air transportation services may be available, are served by aircraft providing air transportation of only cargo with a total annual landed weight of more than 100 million pounds.

RELIEVER AIRPORT (R)
High-capacity general aviation airports in major metropolitan areas that are open to the public, have 100 or more based aircraft, or have 25,000 annual itinerant operations.

GENERAL AVIATION (GA)
Airports that do not receive scheduled commercial service or that do not meet the criteria for classification as a commercial service airport may be included in the NPIAS as general aviation airports if they account for enough activity (having usually at least 10 based aircraft) and are at least 20 miles from the nearest NPIAS airport.

Image by Delta Airport Consultants, Inc.

Section 2 - Regional Context

1.2 | Part 01 - Surrounding Airports

There are five public use, NPIAS airports and several private airports within approximately 30 nautical miles of MRB. **Table 1.2** lists the public use airports and the facilities available at each. A map of public and private use airports within the vicinity of MRB are shown in **Figure 1.3**.

Table 1.2- Existing Area Public Airports

AIRPORT ASSOCIATED CITY	RUNWAYS	LIGHTING/ APPROACH AIDS	INSTRUMENT APPROACHES	FUEL	BASED AIRCRAFT	ANNUAL OPERATIONS
Eastern West Virginia Regional Airport Martinsburg, WV	**8-26**: 8,815 X 150' Asphalt/Grooved	MALSR 4-Box VASI	ILS or LOC; RNAV (GPS); VOR-A	100LL Jet A	79	26,385
Hagerstown Regional Airport- Richard A. Henson Field Hagerstown, MD	**9-27**: 7,000' x 150' Asphalt/Grooved **2-20**: 3,165'x100' Asphalt	PAPIs REILs MALSR MIRL HIRL Beacon	ILS or LOC; RNAV (GPS); VOR	100LL Jet A	151	52,054
Frederick Municipal Airport Frederick, MD	**5-23**: 5,219' x 100' Asphalt/Grooved **12-30**: 3,600' x 75' Asphalt	MIRL HIRL PAPIs REILs ODALS Beacon	ILS or LOC; RNAV (GPS); VOR-A	100LL Jet A	190	66,938
Front Royal-Warren County Airport Front Royal, VA	**10-28:** 3,007' x 75' Asphalt	MIRL VASI Beacon	RNAV (GPS); VOR-B	100LL	52	17,877
Leesburg Executive Airport Leesburg, VA	**17-35:** 5,500' x 100' Asphalt/Grooved	HIRL ODALS PAPIs Beacon	ILS or LOC; RNAV (GPS)	100LL Jet A	246	115,328
Winchester Regional Airport Winchester, VA	**14-32:** 5,498' x 100' Asphalt/Grooved	HIRL PAPIs REILs MALSR Beacon	ILS or LOC; RNAV (GPS); VOR/DME	100LL Jet A	109	44,115

Source: Airport Facility Directory; FAA 5010-1 forms; AirNav.com, FAA Air Traffic Activity Data System (ATADS)

Notes: MALSR- Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
VASI- Visual Approach Slope Indicator
HIRL- High Intensity Runway Light
PAPIs- Precision Approach Path Indicator
REILs- Runway End Identifier Lights
MIRL- Medium Intensity Runway Lights
ODALS- Omni-Directional Approach Lights

SURROUNDING AIRPORTS

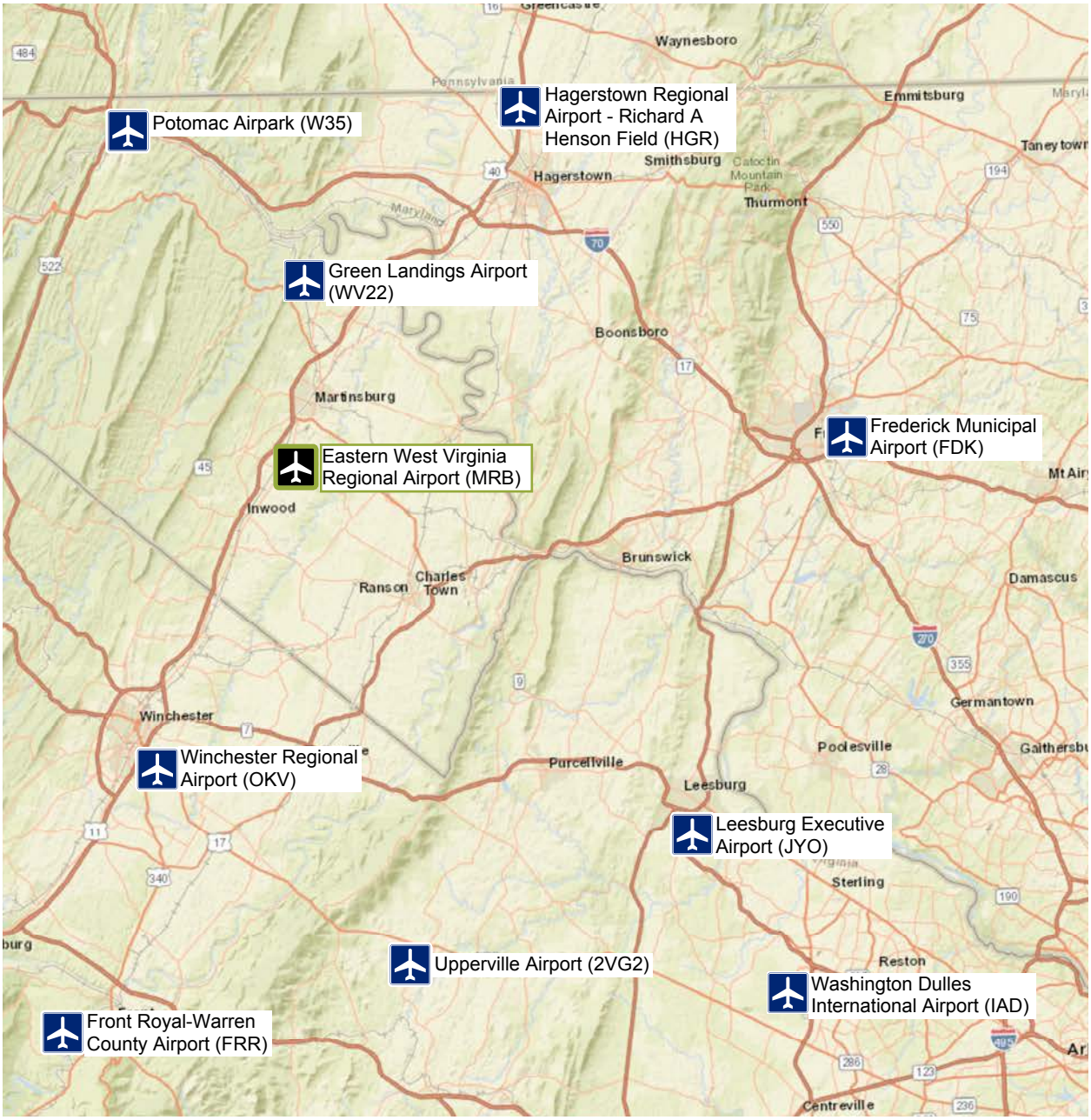

Figure 1.3- Surrounding Airports
Source: Delta Airport Consultants, Inc., Background from National Geographic, Esri, DeLorme, HERE, UNEP-WCNC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, Increment P. Corp.

1.2 | Part 02 - Climate and Topography

Eastern West Virginia Regional Airport is located in the northeastern part of West Virginia, which is also referred to as the Eastern Panhandle. This area of West Virginia is situated between the Blue Ridge Mountains and Shenandoah Valley to the east and the Ridge-and-Valley Appalachian Mountains to the west.

The climate of West Virginia is generally described as a humid sub-tropical climate. The average annual precipitation for rainfall is 38.69 inches and the average annual snowfall is 26 inches. As shown in **Figure 1.4**, average low temperatures within December, January, February, and March are below freezing at 26˚F while average maximum temperatures in July and August are 84˚F.

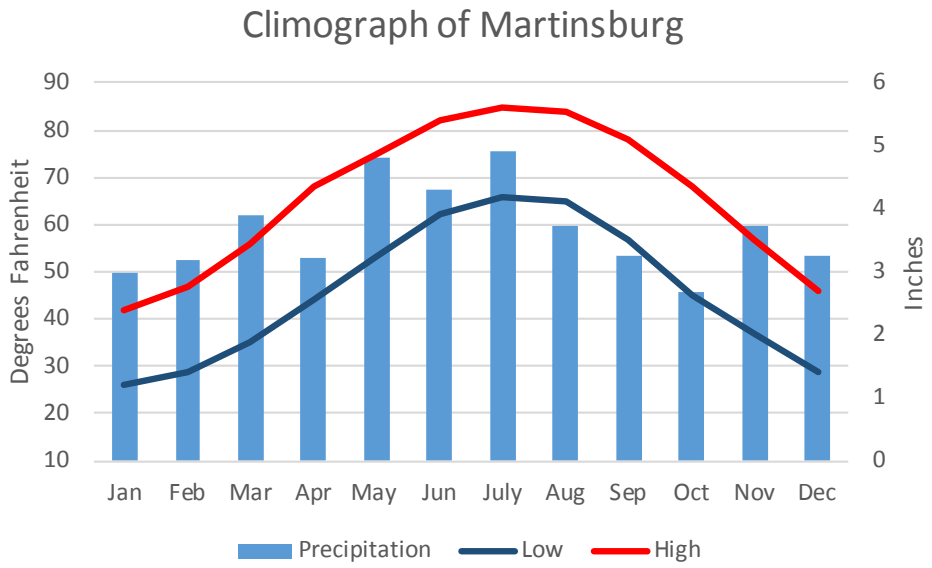

Figure 1.4- Climograph of Martinsburg, WV
Source: www.usclimatedata.com, Delta Airport Consultants, Inc.

1.2 | Part 03 - Service Area and Demographic Profile

POPULATION & HOUSING

The City of Martinsburg is the county seat of Berkeley County, West Virginia. The population of the City of Martinsburg increased at a rate of 16.4% between 2000 and 2010, increasing from 14,804 to 17,227, making it the most populated city in Berkeley County and the 8th most populated city in the state of West Virginia.[1] The population of Martinsburg continued to grow at a rate of 2.7% from 2010 to 2015, increasing from 17,227 to 17,700. U.S Census data also identifies 7,293 households in Martinsburg.

From 1980 to 2009, Berkeley County experienced significant population growth of 83.2 percent.[2] According to the 2010 U.S. Census Profile for Berkeley County, the population was 104,169. The population within Berkeley County was anticipated to grow from 2010 to 2015, increasing overall from 104,169 to 119,824.[3] The current estimated population of Berkeley County is 111,091.[4]

In Martinsburg, the median household income in 2015 was $37,843; while the median household income in Berkeley County was $55,239.[5] Household income in Berkeley County was anticipated to increase by 11.9 percent from 2010 to 2015.[6]

LOCAL ECONOMY

The largest employment industries in Berkeley County are education, health services, trade/transportation utilities, and government. The average unemployment rate for 2016 was 3.8 percent. The top 10 employers as of March 2016 include:[7]

1. Berkeley County Board of Education (Berkeley County Schools)
2. United States Department of Veterans Affairs (Martinsburg VA Medical Center)
3. West Virginia University Medicine
4. Macy's Corporate Services, Inc.
5. Quad Graphics, Inc.
6. Wal-Mart Associates, Inc.
7. FedEx Corporation
8. U.S. Department of the Treasury (Internal Revenue Service)
9. Eastern Panhandle Mental Health Center, Inc.
10. Orgill, Inc.

1 U.S Census 2010 profile data for Martinsburg
2 2010 Berkeley County Comprehensive Plan
3 Community Profile, Berkeley County Development EWVRAA
4 Vintage 2015 Population Estimates
5 U.S. Census 2010 profile data for Martinsburg and Berkeley County
6 Community Profile, Berkeley County Development EWVRAA
7 Workforce West Virginia (2013) (http://lmi.workforcewv.org/EandWannual/TopEmployers.html)

As stated previously, MRB is home to the Shepherd Field-West Virginia Air National Guard Base and its 167th Airlift Wing. Presently the National Guard employs approximately 1,010 personnel. According to the West Virginia Air National Guard 2015 Annual Report, the federal investment in Berkeley County and the City of Martinsburg is approximately $60 million with 49.7 percent of that investment attributed to civilian payroll.[8]

In 2010, the Eastern Panhandle Inland Port Coalition, Inc. was established. Its mission was to establish an intermodal transportation facility at MRB, known as the International Air Freight Terminal Complex. This facility would be designated as a port of entry for U.S. Customs to accommodate the import and export businesses. Consideration for the development of an air freight terminal complex is discussed in greater detail in Chapter Three (Facility Requirements).

1.2 | Part 04 - Surrounding Land Use

LAND USE

The primary cause of incompatibility between airports and surrounding communities is noise

While the City of Martinsburg has comprehensive land-use zoning in place, as of 2016, Berkeley County has not adopted a land use ordinance. In 2006, Berkeley County adopted a Comprehensive Plan and updated the document in 2016. The Comprehensive Plan establishes plans and recommendations for the development of Berkeley County; in particular, the Land Use Element is the County's major tool for directing growth. Since there is no regulatory zoning document in Berkeley County, land use is controlled and managed by land use regulations in Chapter 8A of the West Virginia Code. **Figure 1.5** illustrates the land use for Berkeley County.

Berkeley County's Comprehensive Plan defines developed areas as areas that include residential, commercial, and industrial development. Transportation is key to these developed areas as these areas are largely attributed to having large scale transportation corridors. It identifies the airport as a developed area due to the presence of both commercial and industrial development.

Berkeley County also identifies growth management areas. The airport is located adjacent to an "Industrial Investment Area" (see **Figure 1.6**). Land uses defined within this area are light industrial, heavy industrial, commercial, office parks, and warehousing.

In 2007, the City of Martinsburg adopted its own Comprehensive Plan. The City also has a zoning ordinance as well as a subdivision and land development ordinance. The City's Comprehensive Plan and land ordinances only pertain to the land within the city limits of Martinsburg but may have an indirect impact on the area surrounding the airport.

8 West Virginia National Guard Annual Report 2015

BERKELEY COUNTY LAND USE

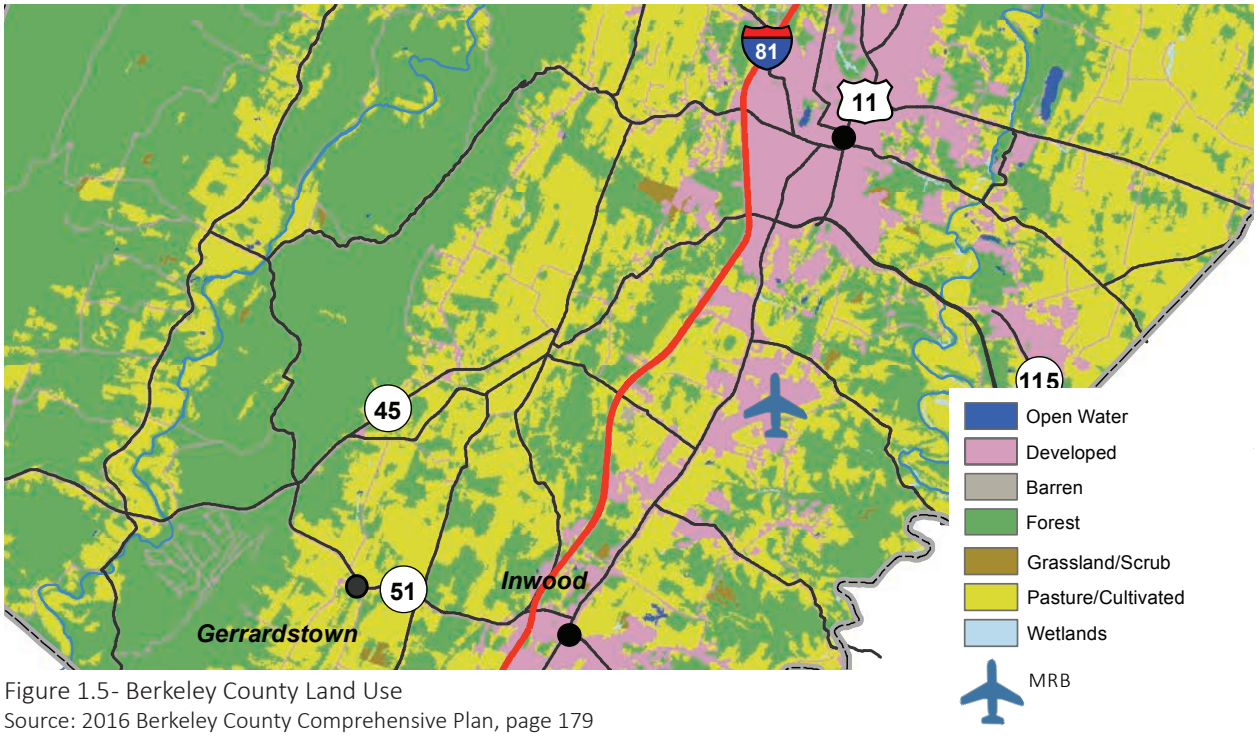

Figure 1.5- Berkeley County Land Use
Source: 2016 Berkeley County Comprehensive Plan, page 179

GROWTH MANAGEMENT AREA

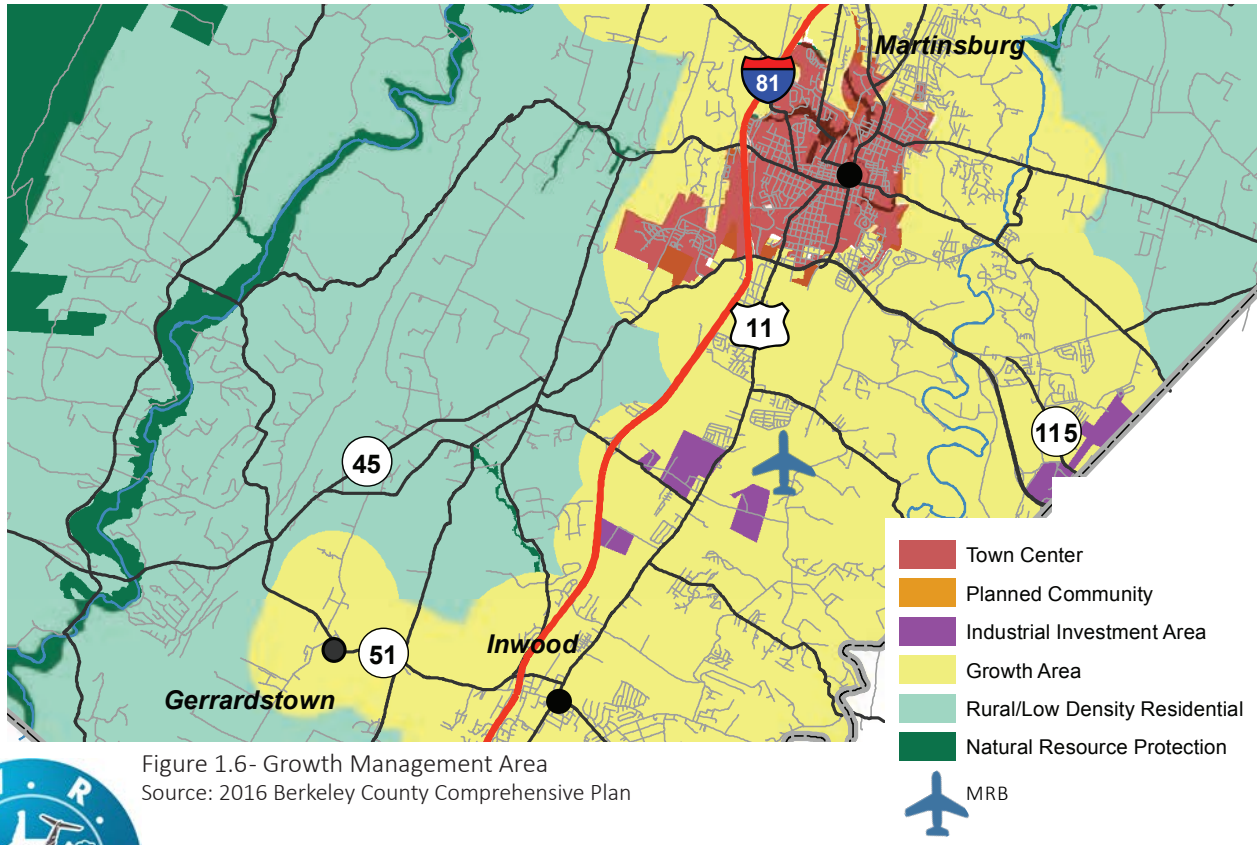

Figure 1.6- Growth Management Area
Source: 2016 Berkeley County Comprehensive Plan

One of the primary causes of incompatibility between airports and surrounding communities is noise. In 2004, Berkeley County enacted an "Ordinance to Limit Height of Objects and to Regulate Placement of Certain Structures Within Specific Areas of Noise Level Around Eastern West Virginia Regional Airport" (Ordinance). The intent of the Ordinance is to protect the surrounding airspace as well as regulate the future construction building of residential and other noise sensitive uses in noise levels 65 decibels and higher for designated areas around the airport.

The Ordinance defines airport zones that include all the land lying beneath the approach surfaces, transitional surfaces, horizontal surfaces, and conical surfaces as they apply to the Eastern West Virginia Regional Airport. Within the airport zones, the Ordinance further restricts uses that "create electrical interference with navigational signals or radio communications between the airport and aircraft, make it difficult for pilots to distinguish between airport lights and others, result in glare in the eyes of the pilots using the airport, impair visibility in the vicinity of the airport, create bird strike hazards, or otherwise in any way endanger or interfere with the landing, takeoff, or maneuvering of aircraft intended to use the airport". The Ordinance does not contain a definition of those uses. However, it is the intention of the Ordinance to depict the airport zones in an "Eastern West Virginia Regional Airport Protection Map," which is illustrated in **Figure 1.7.**

In addition, the Ordinance references the allowance of uses in areas of 75 decibel noise level. Noise level areas are defined as "areas within the footprint of the airport runways in which the level of noise currently created and expected to be by future aircraft uses exceeds safe decibel levels, specifically, levels of 65 decibels or higher". The Airport Protection Map does not depict the noise contours levels on and around the airport.

It is important to note that the 14 CFR Part 77, the federal regulations which define hazards to airspace, was revised and published in July 2010, nearly six years after the adoption of the Ordinance. A review of the Ordinance is encouraged to determine if there are any conflicts with 14 CFR Part 77. Preliminary research of the Ordinance also suggests that the Ordinance may be difficult to enforce due to the absence of the definition of "uses" and the absence of noise contours on the Airport Protection Map.

The federal regulations which define hazards to airspace, 14 CFR Part 77, was revised and published in July 2010, nearly six years after the adoption of the Ordinance. In 2017, the Berkeley County Planning Department initiated the steps to begin reviewing the Ordinance; and in 2018, the Berkeley County Planning Commission and Berkeley County Council directed staff to compile a study to review the existing Ordinance and identify potential amendments to the existing Ordinance.

The 2018 Draft Report of the Airport Height and Zoning Ordinance is included as **Appendix B** of this Master Plan. The 2018 Draft Report reviews the 2004 Ordinance and provides a replacement Ordinance for review and consideration.

FOREIGN TRADE ZONE

The EWVRAA owns and operates a 317-acre business and industrial park known as the John D. Rockefeller IV Science & Technology Center. The business and industrial park is located on and adjacent to airport property.

In February 2000, approximately 317 acres of this Industrial Business Park was designated as Foreign-Trade Zone (FTZ) No. 240 through Order No. 1071. A FTZ is a geographical area, in (or adjacent to) a United States Port of Entry, where commercial merchandise, both domestic and foreign, receives the same U.S. Customs and Border Protection treatment if it were located outside the commerce of the United States. As of fall 2018, the FTZ is not an active FTZ site.

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AIRPORT PROTECTION MAP

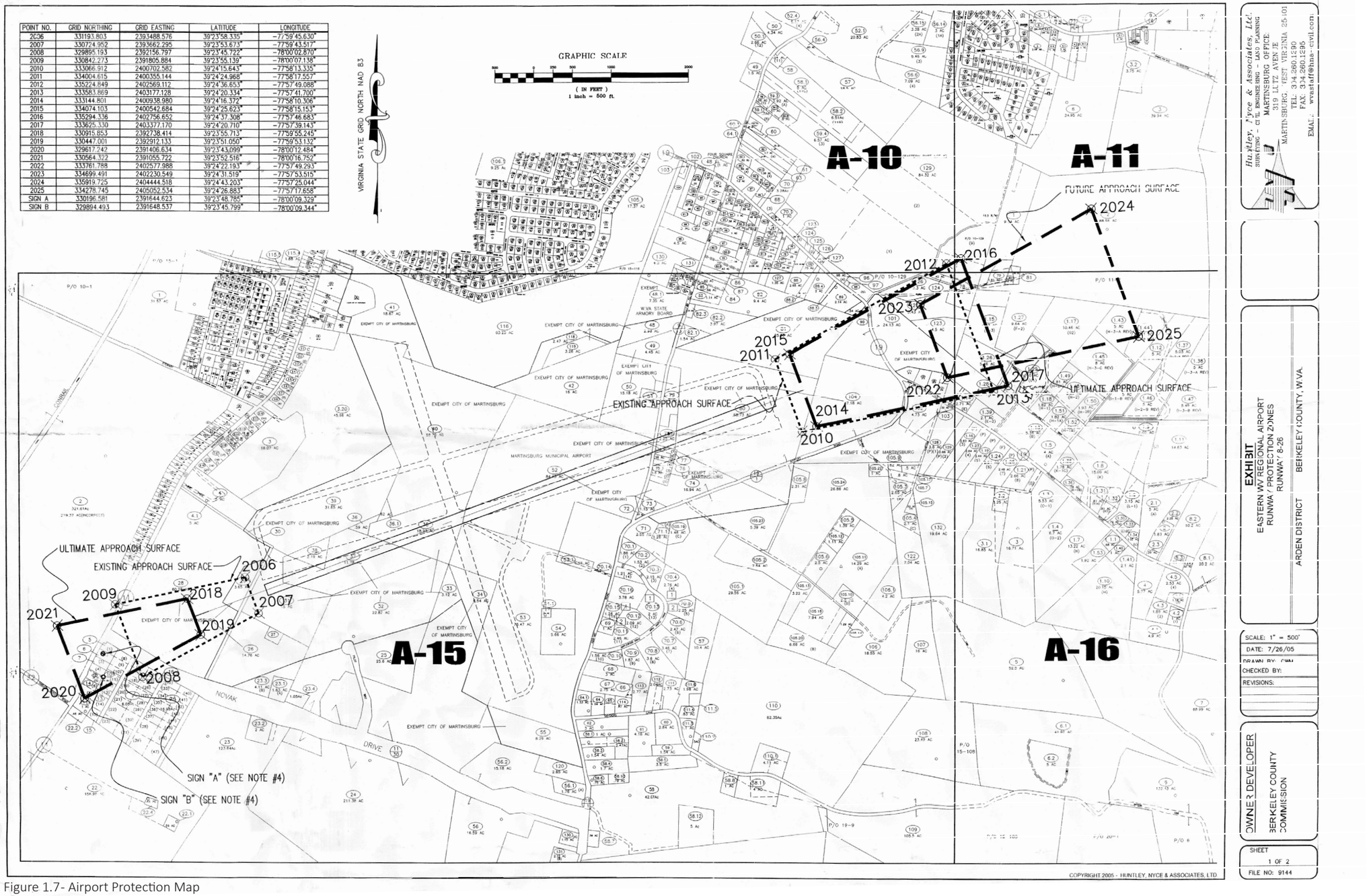

Figure 1.7- Airport Protection Map
Source: Berkeley County Ordinance "To Limit Height of Objects and Regulate Pavement of Certain Structures Within Specific Areas of Noise Levels Around Eastern West Virginia Regional Airport" (2004)

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Image by Delta Airport Consultants, Inc.

Section 3 - Existing Conditions Inventory

In order to obtain an accurate inventory of existing conditions at MRB, available, pertinent data that relates to the airport and its service area were evaluated and cataloged. The scope of this inventory includes a review of existing airport facilities, including, but not limited to, the 2006 ALP. Moreover, the collected information provides the foundation for compilation of aviation forecasts, facility requirements, and future layout components of this planning study.

1.3 | Part 01 - Airfield Configuration and Infrastructure

AIRPORT OPERATIONAL CRITERIA

The Air National Guard (ANG) operates in the northern portion of the airfield, north of Runway 8-26. The 2006 ALP identified airfield design standards based upon Airport Reference Code (ARC) Category C-IV, with the design aircraft being the C-130 and the ultimate aircraft being the C-5A Galaxy (Category C-VI), based on the critical aircraft that the ANG was operating at the facility at that time. Today, the ANG operates the C-17 Globemaster III, a C-IV aircraft. ***This Master Plan recommends that the Runway 8-26 and Taxiway A continue to be designed to C-IV design standards to accommodate ANG operations.***

For the purposes of this Master Plan, airfield design standards for activities located south of Runway 8-26 are evaluated based on civilian, general aviation activity. Keys to identifying the appropriate design criteria are a review of the aircraft

currently based at the airport and an examination of available information related to transient aircraft visiting the airport. A review of the based aircraft inventory and instrument flight rule operational logs show a diverse group of aircraft operates at MRB (see Appendix E). These include a wide variety of single-engine, multi-engine piston, turbo-prop, and jet aircraft, several of which have "B" approach speeds (between 91 and 120 knots) and several with Group II wingspans (between 49 feet and less than 79 feet) (see "Understanding Design Criteria" below). **It is recommended that the airfield design standards for general aviation facilities located south of Runway 8-26 be evaluated based upon Category B-II standards.** **Table 1.3** summarizes the typical aircraft operating at MRB.

UNDERSTANDING...DESIGN CRITERIA

The Airport Reference Code (ARC) is used for planning and design. Unlike the Runway Design Code, it does not limit the aircraft that may be able to operate safely on an airport.

The ARC consists of two components. The first component is the aircraft approach category (AAC) which relates to approach speed of the aircraft. The second relates to the either the aircraft wingspan or tail height and is known as the airplane design group (ADG). According to the FAA AC-13A, Airport Design, the following criteria determine the AAC and ADG:

Aircraft Approach Category:

	Approach Speed
A	Less than 91 knots
B	91 knots-120 knots
C	121 knots - 140 knots
D	141 - 166 knots
E	166 knots or more

Airplane Design Group:

	Tail Height (ft [m])	Wingspan (ft [m])
Group I	Less than 20 feet	Less than 49 feet
Group II	20 feet to less than 30 feet	49 feet to less than 79 feet
Group III	30 feet to less than 45 feet	79 feet to less than 118 feet
Group IV	45 feet to less than 60 feet	118 feet to less than 171 feet
Group V	60 feet to less than 66 feet	171 feet to less than 214 feet
Group VI	66 feet to less than 80 feet	214 feet to less than 262 feet

Airport Reference Code:

B-II

Table 1.3- Typical Aircraft Operating at MRB

AIRCRAFT	ARC	APPROACH SPEED (KNOTS)	WING SPAN (FT)	TAIL HEIGHT (FT)	MAX TAKEOFF WEIGHT (LBS)
C-17 Globemaster III*	C-IV	115	169.8	55.1	585,000
Cessna Skyhawk	A-I	57	36	8.9	2,450
Beechcraft Bonanza	A-I	75	37.8	8.6	3,850
Cessna 182	A-I	70	36	9.3	2,550
Piper Arrow	A-I	70	29.9	7.9	2,491
Cirrus SR22	A-I	78	38.3	8.9	3,600
Piper Cherokee	A-I	72	32.9	7.9	3,400
Piper Cherokee PA28	A-I	65	35.1	7.1	2,425
Aerostar Aircraft Corp	B-I	95	36.7	13.2	6,315
Beechcraft 58 Baron	B-I	96	37.8	9.8	5,500
Beechcraft Super King 200	B-II	98	54.5	15	12,500
Beechcraft King Air 90	B-II	101	50.2	14.3	10,100
Beechcraft Super King 300	B-II	103	54.5	14.3	14,000

Source: Aircraft Manufacturers; Local MRB records; Delta Airport Consultants, Inc.
Notes: This critical aircraft is noted on the airport's current approved ALP.

RUNWAY SYSTEM

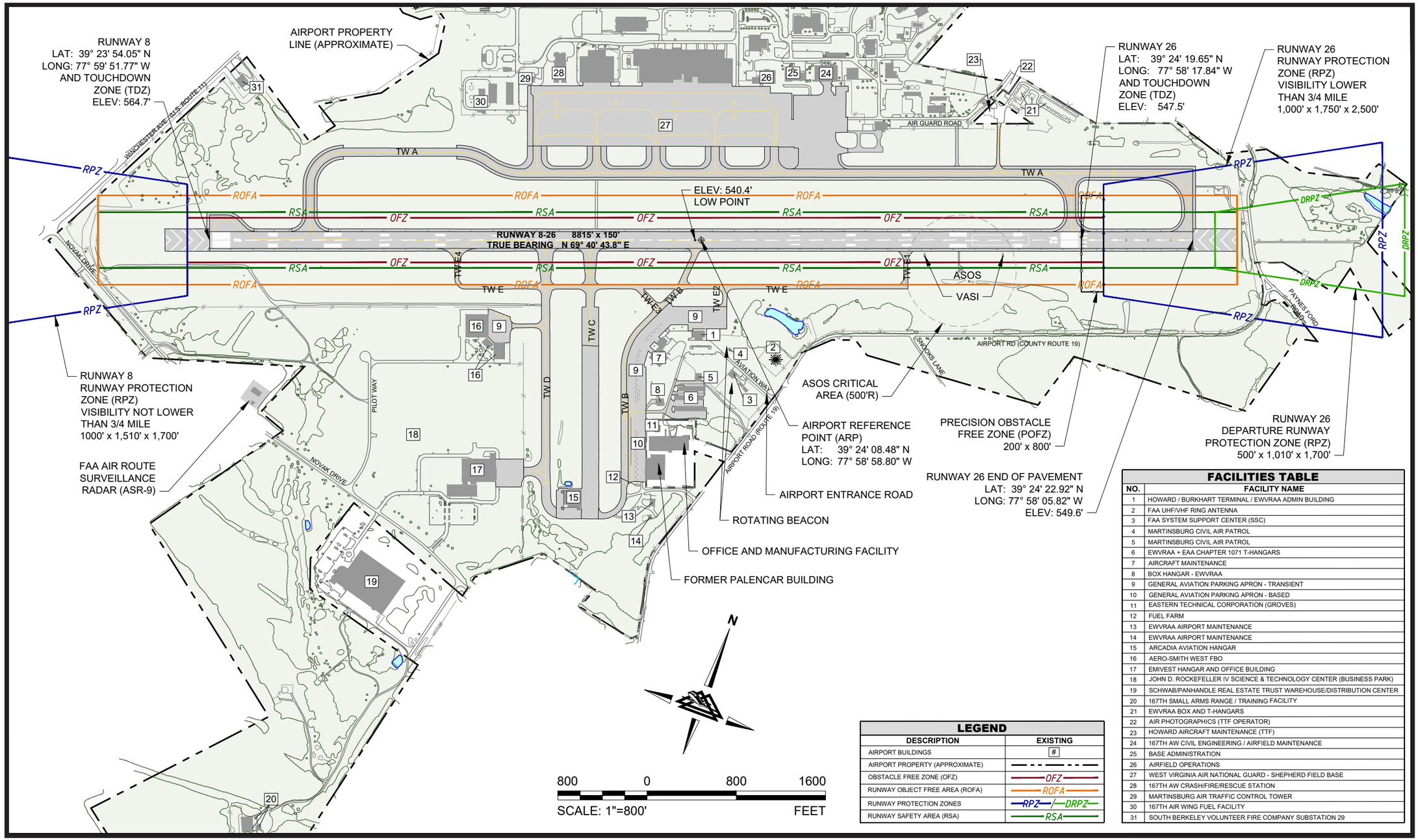
Key elements of the existing runway and taxiway system at MRB are highlighted in **Table 1.4** and depicted in **Figure 1.8**.

Table 1.4- Runway Data

RUNWAY 8-26	
Length	8,815’
Width	150’
Surface	Asphalt/Grooved
Displaced Threshold Elevation	Runway 26- 547.5’
Airport Reference Point Latitude/Longitude	N 39˚24’08.4845” W 077˚58’58.7967”
Elevation (MSL)	564.8
Lighting	HIRL
Marking	Runway 8 Precision / Runway 26 Precision
Approach Aids	Runway 8 / Runway 26 VASI-4 Runway 26 MALSR
ARC	C-IV

Source: FAA Form 5010-1; FAA Datasheet; 02/08/2006 Approved ALP for MRB
Notes: MSL- Mean Sea Level
HIRL- High Intensity Runway Light
VASI- Visual Approach Slope Indicator
MALSR- Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
ARC- Airport Reference Code

EXISTING AIRPORT LAYOUT



LEGEND

DESCRIPTION	EXISTING
AIRPORT BUILDINGS	#
AIRPORT PROPERTY (APPROXIMATE)	
OBSTACLE FREE ZONE (OFZ)	OFZ
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
RUNWAY PROTECTION ZONES	RPZ / DRPZ
RUNWAY SAFETY AREA (RSA)	RSA

FACILITIES TABLE

NO.	FACILITY NAME
1	HOWARD / BURKHART TERMINAL / EWVRAA ADMIN BUILDING
2	FAA UHF/VHF RING ANTENNA
3	FAA SYSTEM SUPPORT CENTER (SSC)
4	MARTINSBURG CIVIL AIR PATROL
5	MARTINSBURG CIVIL AIR PATROL
6	EWVRAA + EAA CHAPTER 1071 T-HANGARS
7	AIRCRAFT MAINTENANCE
8	BOX HANGAR - EWVRAA
9	GENERAL AVIATION PARKING APRON - TRANSIENT
10	GENERAL AVIATION PARKING APRON - BASED
11	EASTERN TECHNICAL CORPORATION (GROVES)
12	FUEL FARM
13	EWVRAA AIRPORT MAINTENANCE
14	EWVRAA AIRPORT MAINTENANCE
15	ARCADIA AVIATION HANGAR
16	AERO-SMITH WEST FBO
17	EMIVEST HANGAR AND OFFICE BUILDING
18	JOHN D. ROCKEFELLER IV SCIENCE & TECHNOLOGY CENTER (BUSINESS PARK)
19	SCHWAB/PANHANDLE REAL ESTATE TRUST WAREHOUSE/DISTRIBUTION CENTER
20	167TH SMALL ARMS RANGE / TRAINING FACILITY
21	EWVRAA BOX AND T-HANGARS
22	AIR PHOTOGRAPHICS (TTF OPERATOR)
23	HOWARD AIRCRAFT MAINTENANCE (TTF)
24	167TH AW CIVIL ENGINEERING / AIRFIELD MAINTENANCE
25	BASE ADMINISTRATION
26	AIRFIELD OPERATIONS
27	WEST VIRGINIA AIR NATIONAL GUARD - SHEPHERD FIELD BASE
28	167TH AW CRASH/FIRE/RESCUE STATION
29	MARTINSBURG AIR TRAFFIC CONTROL TOWER
30	167TH AIR WING FUEL FACILITY
31	SOUTH BERKELEY VOLUNTEER FIRE COMPANY SUBSTATION 29

Figure 1.8- Existing Airport Layout, 2018
Source: Delta Airport Consultants, Inc.

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WIND ANALYSIS

When prevailing winds are consistently from one direction, runways are best oriented in that direction

The orientation of Runway 8-26 to the prevailing wind direction is critical to the safe operation of aircraft, especially small, single engine aircraft that are more susceptible to crosswinds. Crosswinds are winds which tend to be perpendicular to the runway or path of an aircraft while landing or take off.

When prevailing winds are consistently from one direction, runways are best oriented in that direction. In many cases, however, a high degree of consistency of wind direction is not found, and thus the crosswind component is also evaluated to ensure acceptable wind coverage. At an airport with a single runway, that runway should be oriented with respect to the prevailing winds so that at least 95 percent of the time the crosswind component does not exceed permitted velocities. Where a single runway does not provide at least 95 percent coverage, a combined system of runways or a widened runway should be considered that would meet the 95 percent criteria.

The maximum allowable crosswind component for runways is specified in FAA AC-13A , Airport Design, and is based on specific ARC. The 95 percent wind coverage is computed on the basis of the crosswinds not exceeding 10.5 knots for ARC A-I and B-I; 13 knots for ARC A-II and B-II; 16 knots for ARC A-III, B-III, and C-I through D-III; and 20 knots for ARC A-IV through D-IV.

The existing ARC classification for MRB, as indicated on the approved ALP, is C-IV. As described in Section 1.3, the ARC classification for general aviation purposes is B-II. Using the above-referenced criteria, wind coverage was computed for a 13 knot crosswind component as noted in **Table 1.5** and the windroses in **Figures 1.9 and 1.10**. The wind analysis indicates that Runway 8-26 provides greater than 95 percent coverage and there is adequate wind coverage for MRB with the existing runway alignment.

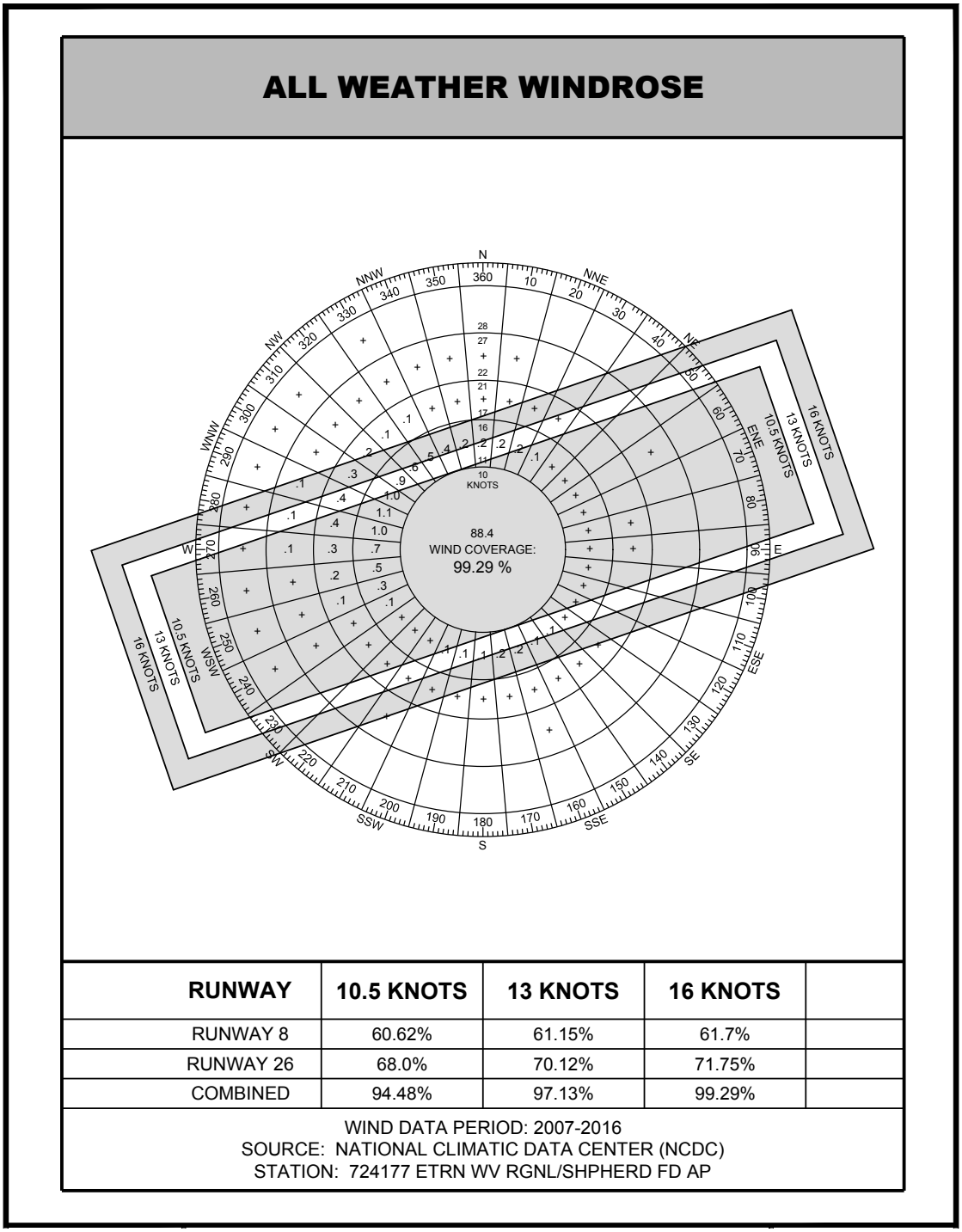
Table 1.5- Wind Coverage (Percent)

AIRCRAFT	ARC		10.5 KNOTS	13 KNOTS	16 KNOTS
All-Weather	Individual Ends	Runway 8	60.62%	**61.15%**	61.7%
		Runway 26	68.0%	**70.12%**	71.75%
	Combination	Runway 8-26	94.48%	**97.13%**	99.29%
IFR	Individual Ends	Runway 8	84.83%	**85.52%**	86.1%
		Runway 26	57.89%	**58.45%**	58.94%
	Combination	Runway 8-26	97.22%	**98.47%**	99.54%

Source: National Climatic Data Center, FAA Standard Wind Analysis Tool, Station: Eastern West Virginia Regional Airport Period of Record: 2007-2016; Delta Airport Consultants, Inc.
Notes: IFR- Instrument Flight Rule

The primary method of analyzing wind conditions at an airport is by using a windrose. **Figures 1.9 and 1.10** illustrate the All Weather and Instrument Flight Rule (IFR) windrose for Runway 8-26. Wind data is represented on the windrose in terms of the percentage of time winds at different velocities originate from various compass directions. The concentric circles on the windrose indicate wind velocity in miles per hour. The radial lines on the windrose define the compass directions from which the winds originate. The numbers within the segments are the percentages of time and velocity the wind originate from the direction.

ALL-WEATHER WINDROSE

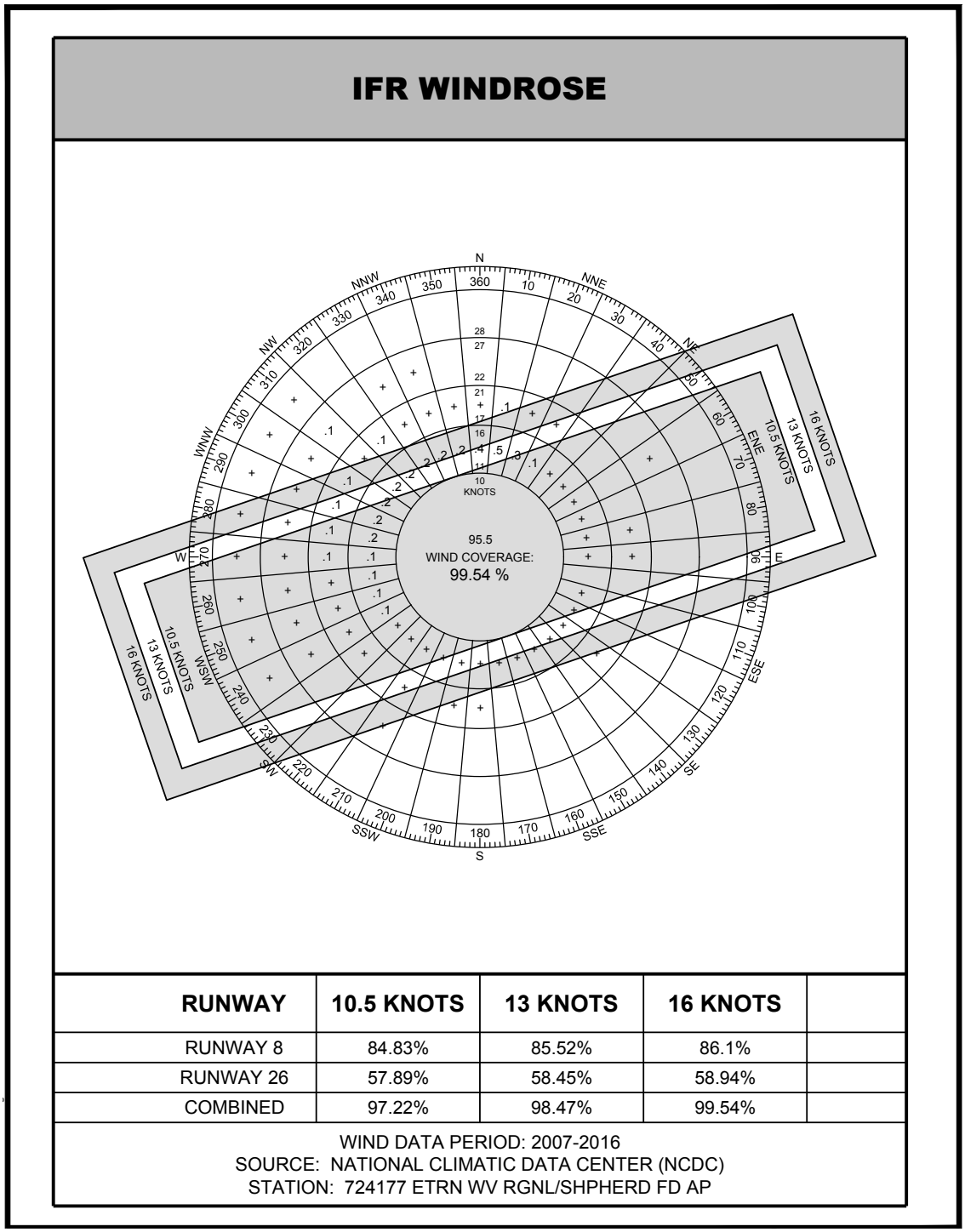


RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS	
RUNWAY 8	60.62%	61.15%	61.7%	
RUNWAY 26	68.0%	70.12%	71.75%	
COMBINED	94.48%	97.13%	99.29%	

WIND DATA PERIOD: 2007-2016
SOURCE: NATIONAL CLIMATIC DATA CENTER (NCDC)
STATION: 724177 ETRN WV RGNL/SHPHERD FD AP

Figure 1.9- All-Weather Windrose
Source: National Climatic Data Center (NCDC); Delta Airport Consultants, Inc.

IFR WINDROSE



RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS	
RUNWAY 8	84.83%	85.52%	86.1%	
RUNWAY 26	57.89%	58.45%	58.94%	
COMBINED	97.22%	98.47%	99.54%	

WIND DATA PERIOD: 2007-2016
SOURCE: NATIONAL CLIMATIC DATA CENTER (NCDC)
STATION: 724177 ETRN WV RGNL/SHPHERD FD AP

Figure 1.10- IFR Windrose
Source: National Climatic Data Center (NCDC); Delta Airport Consultants, Inc.

RUNWAY DESIGNATIONS

Runway 8-26 has a true bearing of N70.63"E

Runway designations for each runway end are determined based on the runway heading from the take-off approach direction to the runway end and are equal to one-tenth of the magnetic azimuth of the runway centerline, measured in the clockwise direction from magnetic north. Although the true heading of the runway will not change over time, the magnetic heading will change as the location of magnetic north shifts over time.

Runway 8-26 has a true bearing of N70.63"E (this is in decimal degrees). According to the National Oceanic and Atmospheric Administration (NOAA), the magnetic declination at the airport is 10.35˚ and drifting approximately 0.017˚ per year. The magnetic bearing for Runway 8-26 is the true bearing corrected for the magnetic declination at a particular time. If the delineation is westerly, it is added to the bearing. Therefore, the current magnetic bearing (in decimal degrees) for Runway 8-26 is N80.98"E. Rounding and truncating to the nearest tens produces a figure of 08. Therefore, Runway 8-26 is aptly labeled and no designation change is needed.

A change in runway designation will be required once the magnetic bearing reaches 09 or 85˚. Since the magnetic declination is only drifting approximately 0.017˚ per year, or approximately 0.8335˚ every 50 years, ***the runway designation will not require any changes in the near future.***

RUNWAY PROTECTION ZONES

A Runway Protection Zone (RPZ) is a trapezoidal area off of each runway end, which varies in size based on the approaches available to each runway end. The FAA prefers that an airport sponsor maintain fee simple ownership for land areas within the defined RPZ to enhance protection of people and property on the ground. Such control includes the clearing and maintenance of incompatible objects and activities. At the present time, **MRB does not have full controlling interest in the RPZs for either Runway 8 or Runway 26 (see Figure 1.8).**

TAXIWAY AND TAXILANE SYSTEM

FAA AC-13A, Airport Design, presents design standards for taxiway and taxilane development. A taxiway is defined as a path established for the taxiing of aircraft from one part of the airport to another. A taxilane is defined as the portion of the aircraft parking area used for the access between taxiways and aircraft parking positions.

Runway 8-26 is supported by Taxiway A, a partial-length parallel taxiway, located on the north side of the runway and approximately 560-feet from the runway centerline (see **Figure 1.8**). Taxiway A provides an entrance to each end of Runway

8-26 with a turnaround at the end of Runway 8. As it is situated north of the runway, the ANG is the predominant user of Taxiway A. Taxiway A also serves general aviation activity situated east of the West Virginia Air National Guard facility.

For general aviation activity, Runway 8-26 is supported by Taxiway E, a partial-length parallel taxiway, located on the south side of the runway and approximately 400 feet from the runway centerline. Taxiway E provides an entrance to the runway at approximately 1,600 feet from the Runway 26 threshold and approximately 2,200 feet from the Runway 8 threshold.

The terminal apron, general aviation apron, and the fixed base operator (FBO) apron are accessed from three parallel connector taxiways that connect both to Taxiway E and Runway 8-26:

- Taxiway C has been repurposed from a previous runway, Runway 17-35, which no longer exists at MRB. Taxiway C provides direct access to one conventional hangar, the Arcardia Aviation Hangar, located at the most southern end of the taxiway;
- Taxiway B provides access to both the terminal apron and general aviation aprons. The segment of Taxiway B south of the general aviation apron (transient) to its terminus at the former south end of Runway 35 is closed to prevent conflicts between aircraft and ground vehicles, fuel trucks, and ambulance traffic moving to and from the Arcadia South Hangar. This closure also recognizes that aircraft and vehicles are on the portion of Taxiway C in front of the hangar doors, with the area functioning as apron space; and,
- Taxiway D provides access to the FBO, AeroSmith, and its facilities as well as to one conventional hangar. Aircraft do not access the Arcadia South hangar from Taxiway D to avoid conflicts with vehicular traffic.

All taxiways are served by Medium Intensity Taxiway Lights (MITLs). Markings for the parallel and connector taxiways are in satisfactory to poor condition. Designated taxilanes lead to and throughout the T-hangar areas as well as between the tie-down parking areas on the aprons. The taxiway and taxilane system is depicted on the Existing Airport Layout in **Figure 1.8**.

AIRPORT PAVEMENTS

Over the years, a significant investment in pavements has been made at MRB. Pavement sections include both airside facilities such as the runway, taxiways, and aircraft parking apron areas as well as landside facilities including roadways and automobile parking. Airfield pavements are designed, constructed, and maintained to support the critical aircraft loads imposed on them and to provide a smooth, skid-resistant surface necessary for the safe operation of aircraft in various weather conditions. Immediately after construction, airport pavements begin a gradual deterioration that is attributable to several factors. Traffic loads in excess of those forecasted during pavement design may reduce the useful life considerably. Normal distresses in the pavement structure result from surface weathering, fatigue effects, and differential movement in the underlying sub-base over a period of years. Consequently, airport pavements require continual routine maintenance, rehabilitation, and upgrading.

The West Virginia Air National Guard maintains the runway and the pavements to the north, including Taxiway A. Pavement conditions for Runway 8-26 and Taxiway A were assessed by the Air Force Civil Engineer Center in 2015.

A Pavement Management Program (PMP), which included an inspection of the pavements on Taxiways B, C, D, and the terminal apron, was prepared in 2016 as part of this Master Plan update. The results of both assessments are illustrated in **Figure 1.11** and depicted in **Table 1.6**. The full Pavement Management Program Implementation report is included as **Appendix C**.

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EXISTING PAVEMENT CONDITION

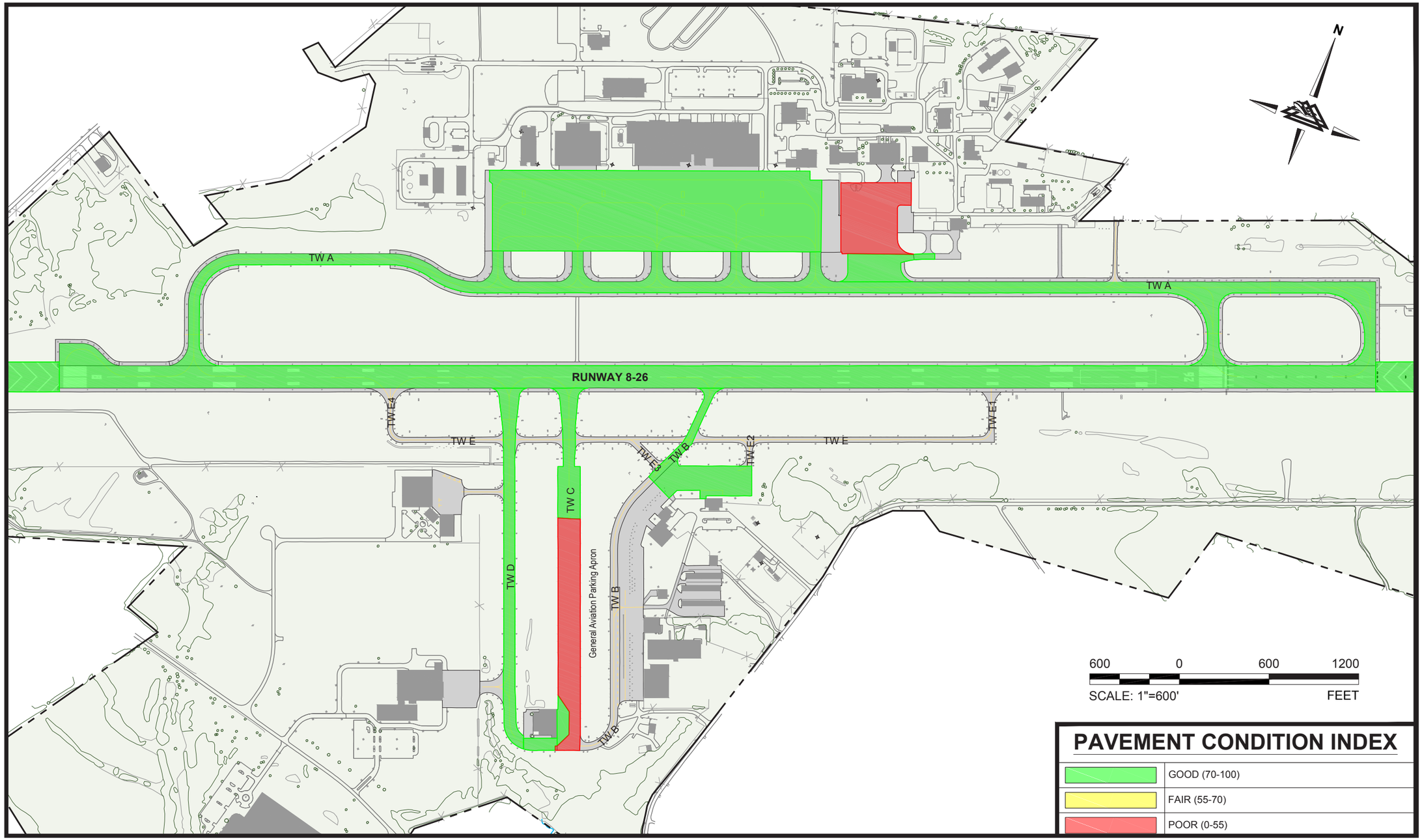

Figure 1.11- Existing Pavement Conditions
Source: 2016 Pavement Management Program Implementation Report/2015 Air Force Civil Engineer Assessment

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Table 1.6- Pavement Condition Summary

2015 AIRFIELD PAVEMENT EVALUATION

Pavement Surface	Surface Area (Square Feet)	Pavement Type	Pavement Condition	Pavement Condition Index (PCI)
Runway 8-26	1,215,661	AC and PCC (Grooved)	Good	70-100
Taxiway A	789,225	AC and PCC	Good	70-100

2016 PAVEMENT MANAGEMENT PROGRAM IMPLEMENTATION REPORT

Pavement Surface	Section	Surface Area (Square Feet)	Pavement Type	Pavement Condition	Pavement Condition Index (PCI)
Terminal Apron	10	82,719	AC	Good	88
	20	2,286	AC	Good	96
	30	34,671	AC	Good	88
Taxiway B	10	15,004	APC	Satisfactory	77
	20	14,250	APC	Good	86
	30	11,250	APC	Good	87
Taxiway C	10	52,167	AC	Satisfactory	82
	20	52,351	APC	Good	99
	30	214,763	APC	Poor	52
	40	18,051	APC	Good	89
Taxiway D	10	60,943	AC	Satisfactory	84
	20	91,329	AC	Satisfactory	83
	30	44,207	AC	Satisfactory	76
	40	17,802	AAC	Good	92

PAVEMENTS NOT FORMALLY EVALUATED

Pavement Surface	Length (feet)	Width (feet)	Pavement Type	Pavement Condition	Pavement Condition Index (PCI)
General Aviation Apron (Transient and Based)	2,100	175	AC	Satisfactory	Not Available
Taxiway B (South of terminus of Terminal Apron to General Aviation Apron)	1,000	50	APC	Satisfactory	Not Available
Taxiway E (includes Taxiway E1-E4)	4,600	35	AC	Good	Not Available

Source: Delta Airport Consultants, Inc.; 2016 Pavement Management Program Implementation Report; 2015 Air Force Civil Engineer Assessment

Notes: AC- Asphalt Concrete Pavement
PCC- Portland Cement Concrete
APC- Asphalt overlay of a Portland Cement Concrete Pavement
AAC- Asphalt overlay of an Asphalt Concrete Pavement

1.3 | Part 02 - Airport Buildings

An inventory of existing airport buildings and facilities is presented in **Figure 1.12**.

1.3 | Part 03 - Terminal Area

The general aviation terminal area for Eastern West Virginia Regional Airport is located on the south side of airport property (see **Figure 1.8**) and consists of terminal facilities, conventional hangars, T-hangars, a tie-down apron, fueling facilities, and auto parking.

AIRPORT ACCESS

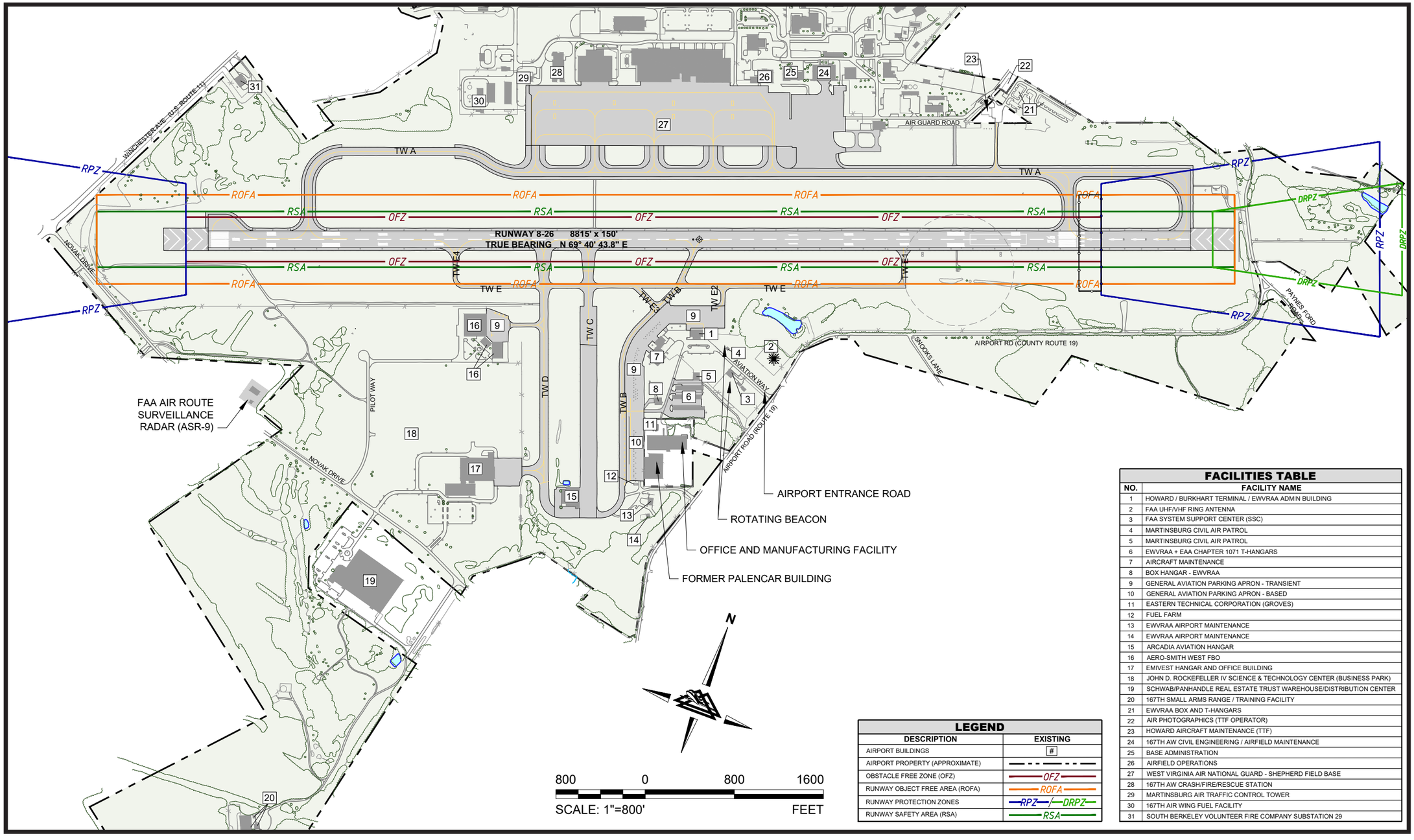
The immediate airport vicinity is served by Interstate 81 and West Virginia State Highway Route 9, which also provide access to other areas in the state and region. Primary access to the airport terminal building and aeronautical services are via Interstate 81 to Business Park Drive/Novak Drive to Airport Road; secondary access can be obtained from United States Highway Route 11 via Paynes Ford Road and Airport Road.

TERMINAL BUILDING

MRB's terminal building was constructed in 2004-2005. The facility is in excellent condition. The building is situated nearest to Taxiway B and Taxiway E. While no longer home to FBO activities, the building provides for the efficient transfer of pilots and passengers between ground transportation and aircraft while serving as a gateway to the local community. The facility includes a lobby museum, pilot's lounge with flight planning facilities, 2,400-square feet of restaurant space with a full-service kitchen, office space for airport staff, general office space, and a conference room.

Terminal Building
Image by Delta Airport Consultants, Inc.

EXISTING AIRPORT BUILDINGS AND FACILITIES



LEGEND	
DESCRIPTION	EXISTING
AIRPORT BUILDINGS	#
AIRPORT PROPERTY (APPROXIMATE)	
OBSTACLE FREE ZONE (OFZ)	OFZ
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
RUNWAY PROTECTION ZONES	RPZ / DRPZ
RUNWAY SAFETY AREA (RSA)	RSA

FACILITIES TABLE	
NO.	FACILITY NAME
1	HOWARD / BURKHART TERMINAL / EWVRAA ADMIN BUILDING
2	FAA UHF/VHF RING ANTENNA
3	FAA SYSTEM SUPPORT CENTER (SSC)
4	MARTINSBURG CIVIL AIR PATROL
5	MARTINSBURG CIVIL AIR PATROL
6	EWVRAA + EAA CHAPTER 1071 T-HANGARS
7	AIRCRAFT MAINTENANCE
8	BOX HANGAR - EWVRAA
9	GENERAL AVIATION PARKING APRON - TRANSIENT
10	GENERAL AVIATION PARKING APRON - BASED
11	EASTERN TECHNICAL CORPORATION (GROVES)
12	FUEL FARM
13	EWVRAA AIRPORT MAINTENANCE
14	EWVRAA AIRPORT MAINTENANCE
15	ARCADIA AVIATION HANGAR
16	AERO-SMITH WEST FBO
17	EMIVEST HANGAR AND OFFICE BUILDING
18	JOHN D. ROCKEFELLER IV SCIENCE & TECHNOLOGY CENTER (BUSINESS PARK)
19	SCHWAB/PANHANDLE REAL ESTATE TRUST WAREHOUSE/DISTRIBUTION CENTER
20	167TH SMALL ARMS RANGE / TRAINING FACILITY
21	EWVRAA BOX AND T-HANGARS
22	AIR PHOTOGRAPHICS (TTF OPERATOR)
23	HOWARD AIRCRAFT MAINTENANCE (TTF)
24	167TH AW CIVIL ENGINEERING / AIRFIELD MAINTENANCE
25	BASE ADMINISTRATION
26	AIRFIELD OPERATIONS
27	WEST VIRGINIA AIR NATIONAL GUARD - SHEPHERD FIELD BASE
28	167TH AW CRASH/FIRE/RESCUE STATION
29	MARTINSBURG AIR TRAFFIC CONTROL TOWER
30	167TH AIR WING FUEL FACILITY
31	SOUTH BERKELEY VOLUNTEER FIRE COMPANY SUBSTATION 29

Figure 1.12- Existing Airport Buildings and Facilities
Source: Delta Airport Consultants, Inc.

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AUTOMOBILE PARKING

Currently, 64 paved automobile parking spaces are designated for public use at the terminal building area. Of the 64 total spaces available at the airport, three are designated as handicap accessible.

AIRCRAFT HANGARS

T-hangars provide storage for single engine and small twin engine aircraft

It is typical for general aviation reliever airports such as MRB to maintain an inventory of both conventional hangars for storage of multiple aircraft of various sizes as well as T-hangars, which often take the form of individually nested structures capable of accommodating one aircraft per unit. T-hangars provide storage for single engine and small twin engine aircraft, while larger aircraft are generally accommodated in conventional hangars.

T-hangars at MRB
Image by Delta Airport Consultants, Inc.

Currently, three T-hangars are located south of the terminal building and east of the general aviation apron: one, seven-unit building; one, eight-unit building; and one, ten-unit building. There are also three T-hangars located in the general aviation area northeast of Runway 8-26: one, 13-unit building, one, three-unit building, and one, four-unit building. (see **Figure 1.12**).

In addition to T-hangars, the civilian facilities at MRB include eleven conventional "box" hangars. South of Runway 8-26, two are located with Aero-Smith West FBO facilities; two are located with Aero-Smith East; three are located on or near the general aviation apron; one is adjacent to Taxilane C; and one is adjacent to Taxiway D. North of Runway 8-26, two hangars are located with the Northeast EWVRAA Civilian/Howard facility.

Figure 1.12 depicts the location of all existing non-military hangars at MRB.

AIRCRAFT APRONS AND TIE-DOWNS

Another method of aircraft storage is apron tie-downs. A tie-down is a metal anchor in the pavement used to secure non-hangared aircraft. Currently, a total of 41 tie-downs are available at MRB in various locations. Tie-down markings on the apron are in fair to poor condition. **Table 1.7** summarizes the area for each apron.

Table 1.7- Aircraft Parking Apron Dimensions and Tie Down Spaces

APRON LOCATION	NO. OF TIE-DOWNS	AREA (SQUARE YARDS)
Terminal	0	10,047
Aero-Smith West (FBO)	6	5,918
General Aviation (Transient North)	18	18,134
General Aviation (Permanent South)	10	12,092
Northeast Civilian (Howard)	7 (unimproved/grass)	8,538

Source: Airport Records; Delta Airport Consultants, Inc.

1.3 | Part 04 - Support Facilities and Services

The following sub-sections describe the various support facilities and services at MRB. Services available at the airport include aircraft hangar rentals, aircraft tie-downs, and refueling. Available support facilities include fuel storage and dispensing equipment, fire protection/emergency services, and ground support and snow removal equipment storage. In addition, the utilities and infrastructure to support these services are also discussed.

MRB has established minimum standards and requirements for the conduct of commercial aeronautical services and activities. As is the case with many airports, the privilege to sell aircraft fuels and lubricants to the general public requires a significant investment by an FBO. In addition to the sale of aircraft fuels and lubricants, an FBO at MRB must also provide line services and support, parking, tiedowns and hangars, aircraft maintenance, and a minimum of three of the following services: flight instruction; aircraft rental; aircraft sales; air taxi service; air charter service; avionics/instrument repair; or propeller repair. Commercial aeronautical service providers that do not provide such a full range of services are typically considered specialized aeronautical service operators (SASO). A SASO operator at MRB is not permitted to provide fuel dispensing services.

FIXED BASE OPERATOR (FBO)

Aero-Smith, Inc. serves as the FBO at MRB and operates activities from its primary facility located on the southwest side of the airport, near the intersection of Taxiways D and E (see **Figure 1.8**). Landside access is from Novak Drive to the Industrial Park Access Road (Pilot Way). The FBO provides services including aircraft fuel, aircraft charter service, pilot training, car rentals, office space, aircraft storage, aircraft management, and aircraft maintenance.

FBO Signage
Image by Delta Airport Consultants

Above-Ground Fuel Storage Tanks
Image by Delta Airport Consultants, Inc.

FUEL STORAGE AND DISPENSING EQUIPMENT

Eastern West Virginia Regional Airport's fuel farm is located at the south end of the general aviation apron and is accessible from Taxiway B. Originally constructed in 1996 in a landside location south of the terminal building, the fuel farm was relocated to its present location in 2006. The markings at the fuel farm are in fair condition.

The fuel farm contains three above-ground fuel storage tanks. The airport owns and maintains the fuel farm and the aircraft fuel is dispensed via trucks owned or leased by the FBO. In addition, the airport owns an oil furnace tank located near the Aero-Smith Inc. East building. **Table 1.8** lists all fuel tanks and trucks located on the airfield.

Table 1.8- Fuel Storage and Dispensing Equipment

EQUIPMENT	CAPACITY	CONTENT USE
AST[1]	12,000 gallons	100LL AvGas
AST	12,000 gallons	Jet A
AST	275 gallons	Unleaded Automotive[2]
AST	1,500 gallons	Oil furnace
Truck	1,500 gallons	100LL AvGas
Truck (2)	3,000 gallons	Jet A

Notes:
1. AST- Above Ground Storage Tank
2. Serves the automotive fleet operated by the FBO, Aero-Smith, Inc.

Source: Airport Records; Delta Airport Consultants, Inc.

GROUND SUPPORT EQUIPMENT STORAGE/SNOW REMOVAL

Eastern West Virginia Regional Airport currently maintains:

- One Oshkosh plow
- One Komatsu rubber tire loader with angle blade and bucket
- One New Holland tractor with full cab 100 hp with bucket
- One Ford F-350 with western plow for inclement winter weather

Maintenance equipment is stored in two metal quonset hut structures located on the south end of Taxiway B, just past the fuel farm. The airport also receives airfield maintenance assistance, including snow removal, for both Runway 8-26 and Taxiway A from the ANG.

FIRE PROTECTION/EMERGENCY SERVICES

Although non-certificated Part 139 general aviation airports such as MRB are not required by the FAA to have on-airport rescue and firefighting (ARFF) services, MRB does have ARFF services provided by the military. While not assigned an ARFF index by the FAA, MRB benefits from the availability of military firefighting services from levels that range between National Fire Protection Association (NFPA) 403 Category 8 standards for C-17 operations and Category 10 standards for C-5 operations. This means the airport can approximate an FAA ARFF Index Category of D/E.

Fire protection for MRB is provided by the ANG (167th AW Crash/Fire/Rescue Department), located on the north side of the airport (see **Figure 1.8**). The facility was constructed by the ANG, and is equipped with 16 vehicle bays with 12 fire trucks, two support vehicles, and one foam trailer. Its location on the property allows for fast response and rapid access to all areas on the airport.

MRB is also home to a second fire station located on the northwestern corner of airport property along U.S. Route 11, though this station does not serve as the primary first responder for on-airport occurrences (see **Figure 1.8**). This is known as the South Berkeley Volunteer Fire Company (SBVFC) of Inwood. The northern portions of their district are served by a three-bay facility known as Substation #29. This facility houses a structural firefighting engine 21 (pumper), and the West Virginia Regional Response Team's light and air support unit, and heavy-duty urban search and rescue/weapons of mass destruction mitigation unit. The SBVFC has an Insurance Services Office, Inc. (ISO) rating of 5/9.

UTILITIES AND SERVICES

Utilities and services at the airport are listed below and illustrated in **Figure 1.13**:

- Water/Sewer: Berkeley County Public Service Water District
- Power (electricity): Potomac Edison (First Energy Corporation)
- Internet: Berkeley County IT Department
- Telephone: Frontier, Comcast, Lumus, Shentel
- Natural Gas: Mountaineer Gas

UTILITIES LAYOUT

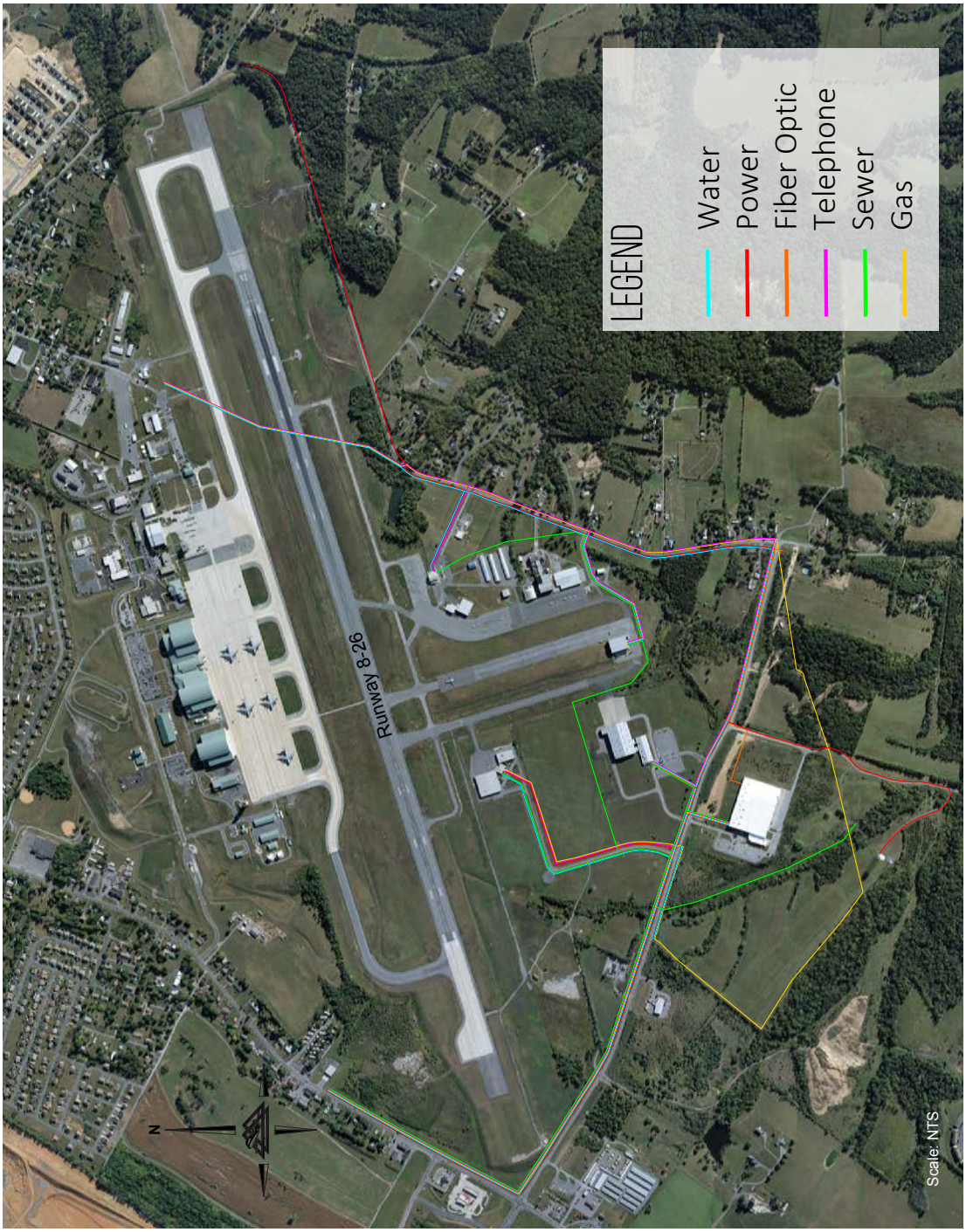


Figure 1.13- Utilities Layout
Source: Delta Airport Consultants, Inc.

4-Box VASI

MALSR System

HIRLS
Images by Delta Airport Consultants

1.3 | Part 05 - Airport Lighting Aids

This section of the chapter details the lighting and visual aids that are available at MRB. These systems aid the pilot in locating and operating in the airport environment. An Airfield Electrical Assessment was conducted as part of this Master Planning effort, which included an evaluation of the airfield lighting system (see **Appendix D**). The evaluation includes an estimation of the condition of the existing airfield lighting system, a recommended replacement program, preliminary cost estimates, and a phasing plan for the upgrade of the airfield lighting system.

VISUAL APPROACH SLOPE INDICATOR (VASI)

A VASI is a system of lights on the side of a runway threshold that provides visual descent guidance information for day and night operations. The lights may be visible from up to five miles during the day and 20 miles or more at night.

MRB has a four-box VASI installation to assist with approaches at the end of Runway 26 (see **Figure 1.8**). The VASI units are owned and maintained by the airport, which conducts routine inspections on the units. **The VASI units are in fair condition**.

MEDIUM INTENSITY APPROACH LIGHTING SYSTEM (MALSR) WITH RUNWAY ALIGNMENT INDICATOR LIGHTS

Approach lighting systems provide the basic means to transition from instrument flight to visual flight for landing. A MALSR is a configuration of signal lights starting at the landing threshold and extending into the approach area to a distance of 2,400-feet. The system is owned and maintained by the FAA. **Runway 26 is equipped with a MALSR system with embedded runway lights that is in good condition.**

RUNWAY EDGE LIGHTS

Runway edge lights outline the edges of runways during periods of darkness or restricted visibility conditions. These light systems are classified according to the intensity or brightness they are capable of producing and are identified as High Intensity Runway Lights (HIRLs), Medium Intensity Runway Lights (MIRLs), or Low Intensity Runway Lights (LIRLs). **Runway 8-26 at MRB is equipped with HIRLs that are in poor condition and are at measurable risk of failure.** A more comprehensive evaluation of the runway edge lights is detailed in the Airfield Electrical Assessment in **Appendix D**.

MITLs

Taxiway Location Sign

Electrical Vault
Images by Delta Airport Consultants

TAXIWAY EDGE LIGHTS

Taxiway edge lights outline the edges of taxiways. Similar to runway edge lights, these light systems are classified according to the intensity of the light they emit. All taxiways at MRB are equipped with Medium Intensity Taxiway Lights (MITLs). The West Virginia Air National Guard owns, operates, and maintains the Taxiway A lights. **The MITLs for Taxiways B, C, D, and E are currently in poor condition and are at a measurable risk of failure.** A more comprehensive evaluation of the taxiway edge lights is detailed in **Appendix D**.

AIRFIELD SIGNS

The purpose of airfield signage is to guide and direct pilots on the airfield. There are six types of signs installed on airfields: mandatory instruction signs, location signs, direction signs, destination signs, information signs, and runway distance remaining signs. MRB owns, operates, and maintains 22 airfield guidance signs and six runway distance remaining signs. **The airfield guidance signs are in fair condition and the runway distance remaining signs are in good condition.** A more comprehensive evaluation of the airfield signs is detailed in **Appendix D**.

ELECTRICAL VAULT

The airfield electrical vault is located in the basement floor of the terminal building and is owned, operated, and maintained by EWVRAA. This electrical room is well laid out and in good condition. The runway and general aviation side of the airfield are powered by the electrical vault. The West Virginia Air National Guard owns, operates, and maintains two constant current regulators for Taxiway A. The electrical vault is described more comprehensively in **Appendix D.**

CONTROL OF AIRPORT LIGHTING SYSTEMS

The Eastern West Virginia Regional Airport is one of many airports in the United States that is not staffed with an air traffic controller 24-hours per day; therefore, it provides a pilot-controlled airfield lighting system. The Martinsburg Air Traffic Control Tower (ATCT) currently operates 96 hours per week, Monday through Friday from 8:00 A.M. to midnight and Saturday and Sunday from 9:00 A.M. to 5:00 P.M. in the spring and summer months. In the fall and winter months, the ATCT operates Monday through Friday from 7:00 A.M. to 11:00 P.M. and on Saturday and Sunday from 8:00 A.M. to 4:00 P.M. This system is activated by keying the aircraft's microphone switch several times in rapid succession on a predetermined and published radio frequency (known as Pilot-Controlled Lighting (PCL)). PCL provides a greater degree of safety for the pilot and reduces the operating cost and maintenance of the airfield lighting system.

The radio frequency serving this system, also known as the Common Traffic Advisory Frequency (CTAF), eliminates the need for pilots to change frequencies to turn the lights on and allows a continuous listening watch on a single frequency. A CTAF is a frequency designated for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating control tower. The CTAF frequency at MRB is 124.3 MHz and is published on the instrument approach chart and in other appropriate aeronautical publications.

1.3 | Part 06 - Airport Weather Conditions and Services

ASOS
Image by Delta Airport Consultants, Inc.

Airport weather conditions are often monitored by automated observing systems. These systems provide detailed data that is available to pilots via a recorded message accessed by a specified radio frequency or telephone contact. Two such systems are currently in use at MRB: (1) Automated Surface Observing System (ASOS) and (2) Automated Weather Observing System (AWOS).

MRB has an on-site WX-ASOS that reports altimeter readings, barometric pressure, density altitude, wind directions/speed/gusts, visibility, precipitation type, sky cover/condition, temperature, and dew point. The WX-ASOS frequency is 119.925 MHz and the system is located on the south side of Runway 26. The ASOS units are operated and controlled cooperatively in the United States by the National Weather Service (NWS), FAA, and Department of Defense (DOD). AWOS weather data is available to pilots via an AWOS-3 located at Winchester Regional Airport (OKV). The AWOS frequency is 124.85 MHz.

Rotating Beacon
Image by Delta Airport Consultants

Supplemental Wind Cone
Image by Delta Airport Consultants

1.3 | Part 07 - NAVAIDs

This section discusses both visual and electronic Navigational Aids (NAVAIDS) for MRB. There are various types of electronic NAVAIDS that provide specific support to the system of air navigation. NAVAIDS may provide enroute navigation support, as well as assistance in performing established instrument approach procedures for the purpose of landing at an airport.

ROTATING BEACON

The rotating beacon is a visual NAVAID used to assist pilots in locating the airport environment using a rotating light with green and white lenses to produce a flashing effect. A combination of white and green lights signifies to pilots that MRB is a lighted, land airport. Within its Class D airspace, operation of MRB's airport beacon during daylight hours typically indicates that ground visibility is less than three miles and/or the ceiling is less than 1,000-feet. The beacon is located approximately 950 feet from the Runway 8-26 centerline. The beacon operates from sunset to sunrise and in poor visibility conditions. The beacon was installed in 1994 and is in good condition.

WIND CONES

Wind indicators aid pilots in determining wind direction and approximate intensity which in turn yields take-off and landing information. The primary wind cone at MRB is located approximately 660 feet south of the Runway 8-26 centerline, near the terminal building. The wind cone is in good working condition. Presently, there is no segmented circle installed around the primary wind cone.

The Runway 26 Supplemental Wind Cone is currently located 400 feet from the centerline of Runway 8-26 and 500 feet from the Runway 26 displaced threshold, between Runway 8-26 and Taxiway A. The wind cone is located on the edge of the runway object free area (ROFA). The wind cone is in good working condition.

The Runway 8 Supplemental Wind Cone is currently located 250 feet south of the Runway 8-26 centerline and 1,000 feet from the Runway 8 threshold. The wind cone is positioned inside the ROFA. The wind cone is in good working condition.

1.3 | Part 08 - Instrument Approach Procedures

MRB has three published instrument approach procedures to Runway 8-26. Runway 26 has a precision Instrument Landing System (ILS) approach, and both Runway 8 and Runway 26 have a non-precision Area Navigation (RNAV) with Global Positioning System (GPS) approach. Each instrument approach procedure includes a decision altitude (DA) or minimum descent altitude (MDA) and minimum visibility, beyond which point the pilot must execute a missed approach and re-attempt the landing effort or divert to another airport. The altitude references are expressed in Mean Sea Level (MSL) and Above Ground Level (AGL) on published instrument approach charts by pilots. The visibility minimums for MRB's published approaches vary depending on the approach category of the given aircraft. The following is a brief description of each NAVAID, and the related procedure, available to support instrument approaches at MRB.

VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATIONS (VOR)

The VOR station forms the basic element of the enroute electronic navigation system in the United States by transmitting a very high frequency (VHF) signal providing azimuth information to the pilot. Since the signal is VHF, it is subject to the line of sight restriction and the range varies with the altitude of the receiving equipment. A VOR located on or near an airport that is used for non-precision approaches is known as a terminal class VOR (TVOR). VORs can also be co-located with Distance Measuring Equipment (DME), which provides distance information (in nautical miles) from the aircraft to the DME station. VOR/DME equipment used by civilian aircraft was enhanced to support military operations in development of the Tactical Navigation (TACAN) system. These TACAN stations were integrated with civil VOR/DME stations and are known as VORTAC stations.

MRB has a VOR approach (VOR-A) to Runway 8-26. The MRB VORTAC is located 5.7 nautical miles from the airport and operates at 112.1 MHz. The VOR-A chart is depicted in **Figure 1.14**.

INSTRUMENT LANDING SYSTEM (ILS)

Eastern West Virginia Regional Airport is equipped with an ILS that includes a localizer system and glide slope system. Together, these two systems form a Category I ILS. The ILS is designed to provide an approach path for exact alignment and descent of an aircraft on final approach to a runway. The localizer provides horizontal guidance to the runway and the glide slope provides vertical guidance. The ILS is typically used when instrument meteorological conditions (IMC) require the pilot to employ instrument flying rules (IFR). The published ILS approach for Runway 26 is depicted in **Figure 1.15**.

VOR-A

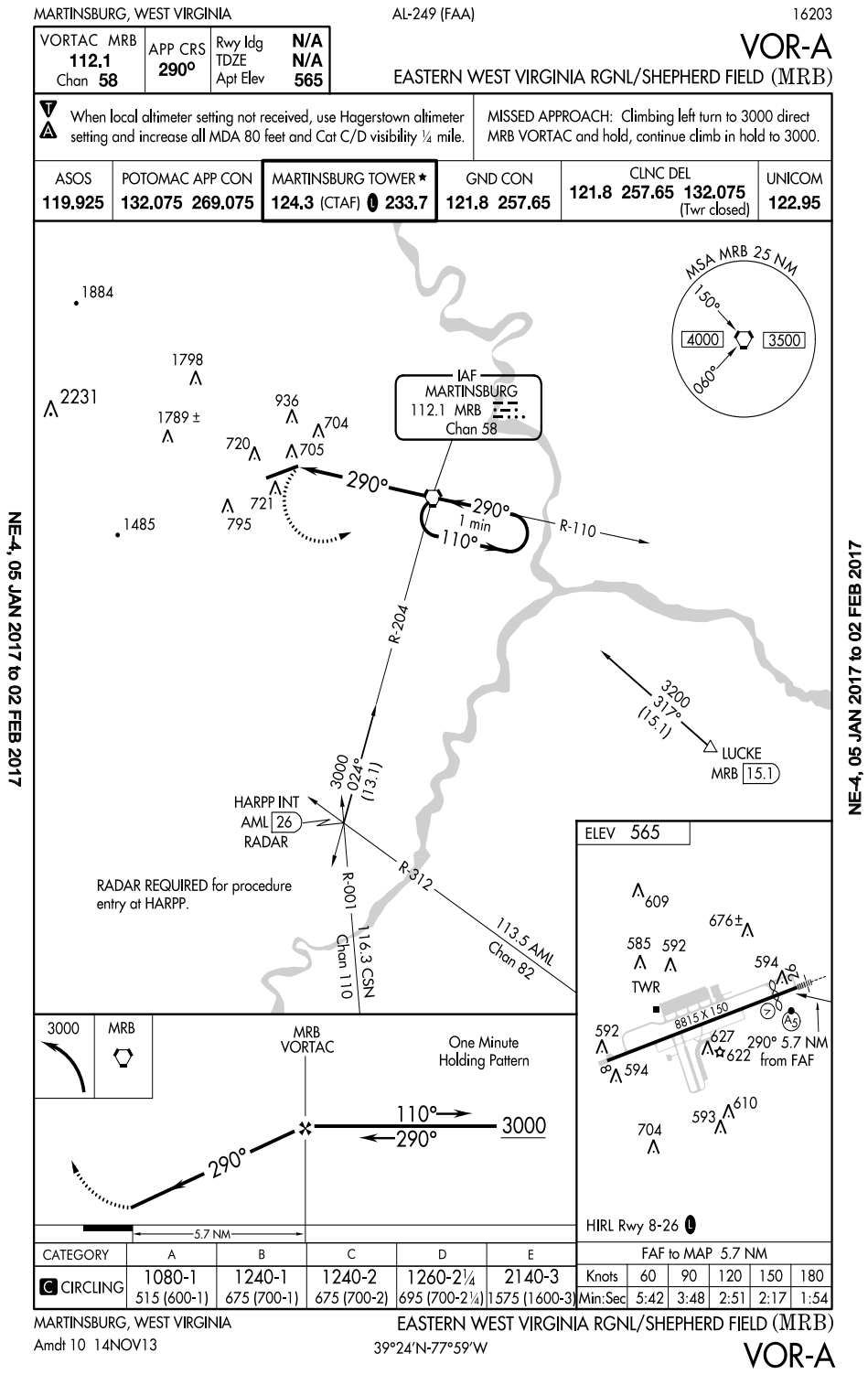


Figure 1.14- VOR-A
Source: FAA Terminal Procedures

ILS OR LOC RUNWAY 26

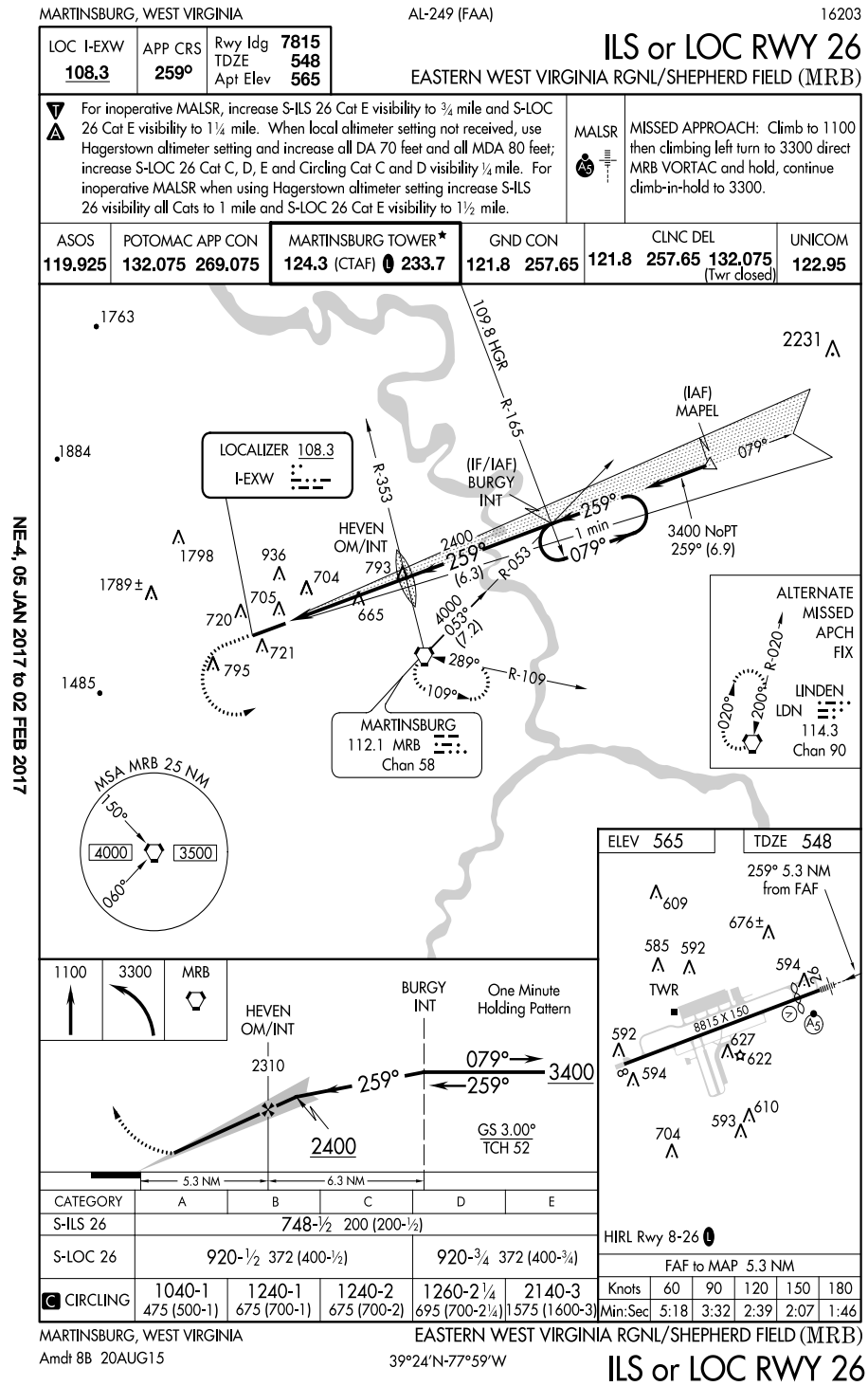


Figure 1.15- ILS or LOC Runway 26
Source: FAA Terminal Procedures

RNAV/GPS RUNWAY 8 AND 26

GPS is a space-based radio-navigation system that provides users with information on position, velocity, and time anywhere in the world and in all weather conditions, by cross referencing signals satellites. GPS airport instrument approach procedures can typically be subdivided into three types: the overlay approach; the GPS only approach; and RNAV approach.

The RNAV approach employs a method of aircraft navigation that permits aircraft operation on any desired course within the coverage of station referenced navigational signals or within the limits of a self-contained system capability. This type of navigation allows a pilot to fly a selected course to a predetermined point without the need to overlay ground based navigation stations. Such area navigation uses "way points" (computer generated points of reference), thereby providing a flexible routing capability that allows for better utilization of airspace than other navigational systems. When programmed by the pilot, the receiver on-board the aircraft automatically selects appropriate signals from the available satellites and translates these into three-dimension position, velocity, and time references. The published RNAV (GPS) approach procedures for Runway 8 and Runway 26 are depicted in **Figures 1.16** and **Figures 1.17**, respectively.

RNAV (GPS) RUNWAY 8

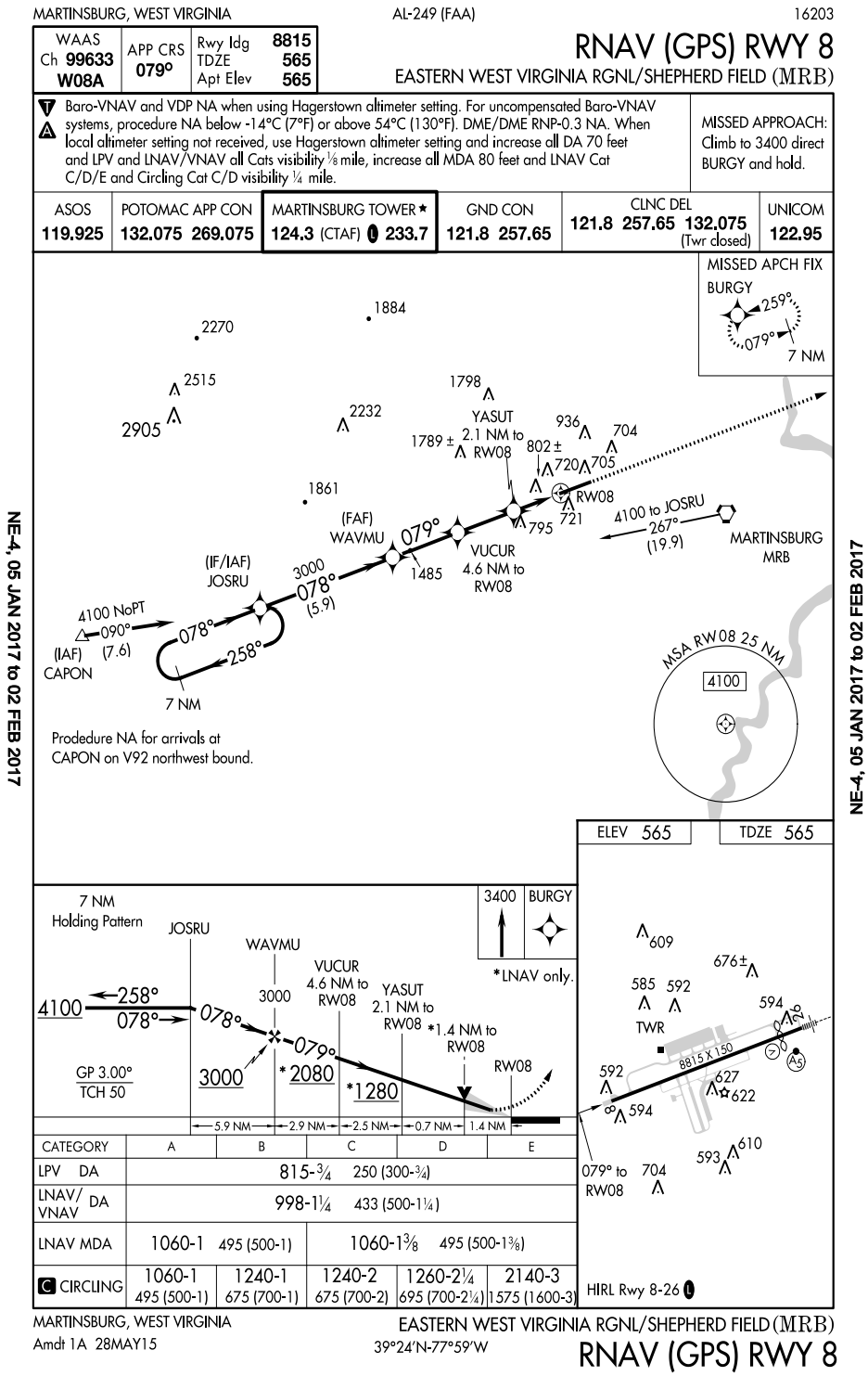


Figure 1.16- RNAV (GPS) Runway 8
Source: FAA Terminal Procedures

RNAV (GPS) RUNWAY 26

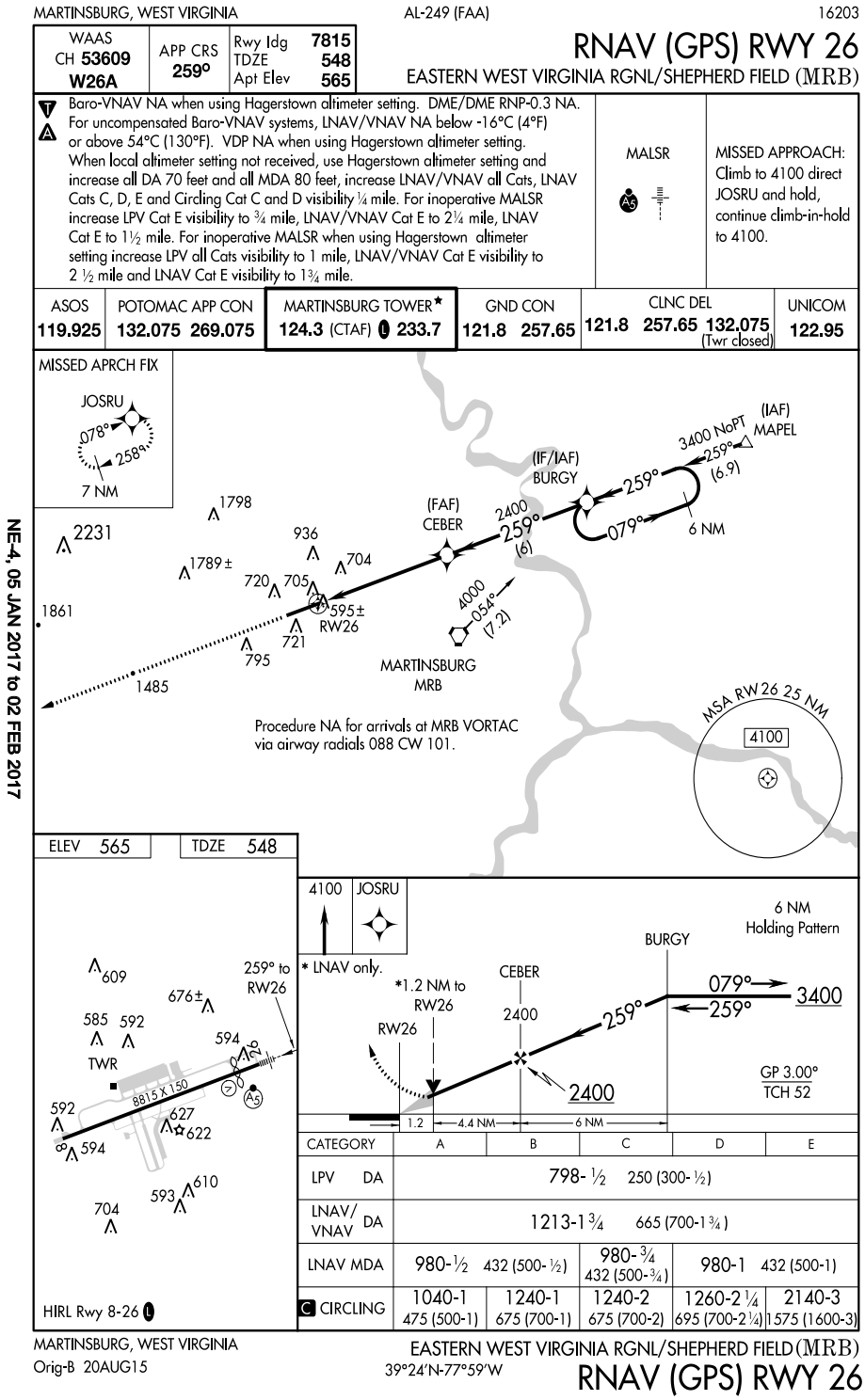


Figure 1.17- RNAV (GPS) Runway 26
Source: FAA Terminal Procedures

1.3 | Part 09 - Airspace

AIRSPACE STRUCTURE

MRB is located within two airspace classifications, Class D and Class E

There are six airspace classifications (see **Figure 1.18**). MRB is located within two airspace classifications, Class D and Class E. The Class D airspace encompasses the area from the ground level up to 2,500 feet AGL (3,100 MSL) when the ATCT is in operation. When the tower is not operating, MRB is located in Class E airspace above 700 feet AGL to 18,000 feet AGL. Class E airspace is a controlled area which includes airspace corridors identified as federal airways or which accommodates jet traffic at low altitudes. The Class E controlled airspace around the airport starts at 700-feet AGL and extends vertically to 18,000-feet MSL when it reaches Class A airspace.

The established Visual Flight Rules (VFR), enroute airways, and associated reporting points in the vicinity of MRB are shown in **Figure 1.19**. **Figure 1.20** depicts the IFR airspace surrounding MRB.

UNDERSTANDING...AIRSPACE

The airspace categories are designated as Class A, B, C, D, E, and G, transition areas and continental control area (**Figure 1.19**). The Class B, C, and D areas are ascribed to Airport Traffic Areas (ATA). Each class of ATA has a given radius, with Classes B and C having extensions (transition areas) to encompass the final portion of an instrument approach procedure.

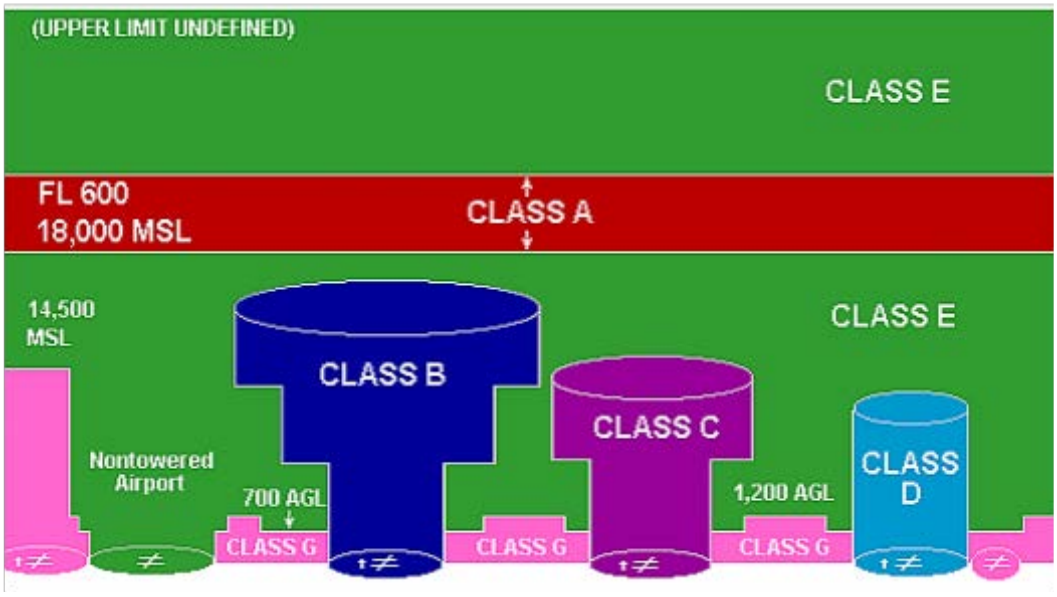


Figure 1.18- Federal Airspace Classifications
Source: Federal Aviation Administration

14 CFR PART 77 IMAGINARY SURFACES

MRB is currently designated as a Category C-IV airfield and offers a precision instrument approach (50:1 slope) to Runway 26 and a non-precision instrument approach (34:1 slope) to Runways 8 and 26. Any existing fixed or mobile objects are, and future objects may be, obstructions to air navigation if they are of greater height than any of the heights or surfaces outlined in 14 CFR Part 77.23.

UNDERSTANDING...14 CFR PART 77

14 CFR Part 77:

1. Establishes standards for determining obstructions in navigable airspace
2. Sets forth the requirements for notice to the Administrator of certain proposed construction or alteration
3. Provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace
4. Provides for public hearings on the hazardous effect of proposed construction or alteration on air navigation
5. Provides standards for establishing antenna farm areas.

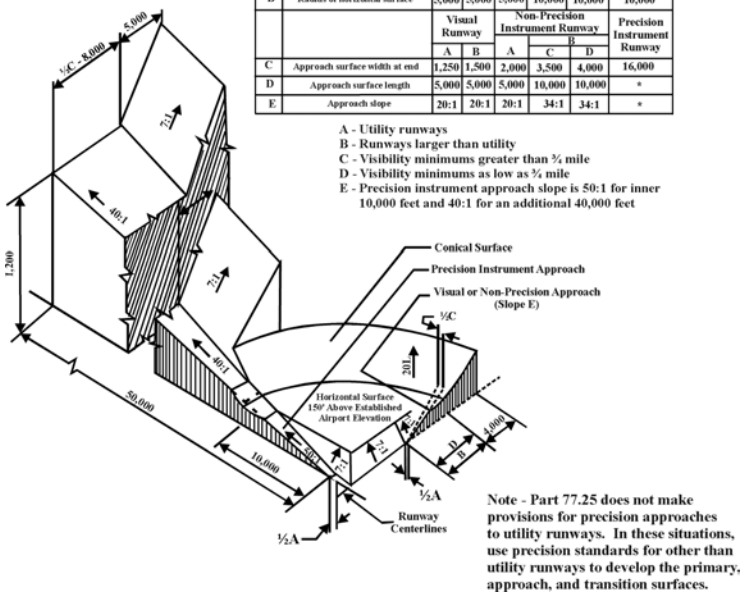
Obstructions to air navigation are any existing or proposed objects, fixed or mobile, in greater height than the imaginary surfaces outlined within 14 CFR Part 77.23. Civil airport imaginary surfaces established under 14 CFR Part 77 for each runway include:

- Primary Surface
- Approach Surface
- Transitional Surface
- Horizontal Surface
- Conical Surface

Existing penetrations to the 14 CFR Part 77 surfaces are considered hazards unless they have been studied by FAA and determined not to be hazards. The determination of whether a proposed obstruction is a hazard is accomplished through an aeronautical study. The standards apply to all objects, whether manufactured, natural growth, or terrain.

DIM	ITEM	Dimensional Standards (Feet)					
		Visual Runway		Non-Precision Instrument Runway			Precision Instrument Runway
				A	B		
		A	B		C	D	
A	Width of primary surface and approach surface width at inner end	250	500	500	500	1,000	1,000
B	Radius of horizontal surface	5,000	5,000	5,000	10,000	10,000	10,000
		Visual Runway		Non-Precision Instrument Runway			Precision Instrument Runway
				A	B		
		A	B		C	D	
C	Approach surface width at end	1,250	1,500	2,000	3,500	4,000	16,000
D	Approach surface length	5,000	5,000	5,000	10,000	10,000	*
E	Approach slope	20:1	20:1	20:1	34:1	34:1	*

A - Utility runways
B - Runways larger than utility
C - Visibility minimums greater than ¾ mile
D - Visibility minimums as low as ¾ mile
E - Precision instrument approach slope is 50:1 for inner 10,000 feet and 40:1 for an additional 40,000 feet



Note - Part 77.25 does not make provisions for precision approaches to utility runways. In these situations, use precision standards for other than utility runways to develop the primary, approach, and transition surfaces.

Source: Federal Aviation Administration, FAR PART 77.25

In order to fully protect MRB airport environs from potential hazards to air navigation, it is important that the obstruction analysis evaluate penetrations based on the Part 77 imaginary surfaces for the non-precision instrument runway and the precision runway. There are known obstructions to the Part 77 surfaces; further documentation and analysis will be provided in Chapter Three of this Master Plan.

FAA AC 70/7460-1, Obstruction Marking and Lighting, provides information to persons proposing to erect or alter an object that may affect navigable airspace. It explains the need to notify the FAA before construction begins and the FAA's response to such notice as required by 14 CFR Part 77. This requirement applies to activities on, and off, airport property, for distances including, but not limited to, 20,000 feet from the nearest point of a runway. The airport sponsor has the responsibility to ensure the approaches to the airfield are adequately cleared and protected.

AIRPORT COMMUNICATIONS

The airport has a U.S. DOD ATCT, known as the Martinsburg Tower. The Martinsburg ATCT is staffed by employees of Dynamic Science, Inc. (Exodyne), which is under contract with the DOD. The tower is located on the west side of the Air National Guard Base and north of the airfield. When the ATCT is not in operation, the Washington Air Route Traffic Control Center (ARTCC) provides radar separation on all aircraft operating on IFR flight plans within controlled airspace, and principally during the enroute phase of flight.

The airport may be reached by calling the Airport Manager at (304) 263-2106 for general information or operational requests. The airport also has an on-site WX-ASOS that provides up-to-date local weather reporting at (304) 264-0988. Radio communication frequencies available at MRB and within the airport area are listed in **Table 1.9**.

Table 1.9- Radio Frequencies

SOURCE	FREQUENCY
CTAF[1]	124.3
Unicom	122.95
WX-ASOS[2]	119.925
Martinsburg Tower	124.3
Martinsburg Ground	121.8
Potomac Approach/Departure	126.825

Notes:
1. Common Traffic Advisory Frequency
2. WX- Automated Surface Observing System

Source: AirNav

Airport Surveillance Radar
Image by Delta Airport Consultants

AIRPORT SURVEILLANCE RADAR

Martinsburg is also host to a FAA Airport Surveillance Radar (ASR-9). The ASR-9 provides coverages for much of the Northern Shenandoah Valley. Radar targets are remoted to the Potomac Consolidated Terminal Radar Approach Control (TRACON) to provide the "to the ground coverage" 24-hours per day. The Martinsburg ATCT also uses the radar as a visual aid for aircraft tracking purposes. It is a radar system used at airports to detect and display the position of aircraft in the terminal area or the airspace around airports. It typically controls traffic within a radius of 30 to 50 nautical miles of an airport. The ASR that operates at MRB is located off of airport property, south of the end of Runway 8 (see **Figure 1.12**). The facility is accessed from Novak Drive. The ASR is owned and maintained by the FAA.

VFR AIRSPACE AND AIR TRAFFIC CONTROL

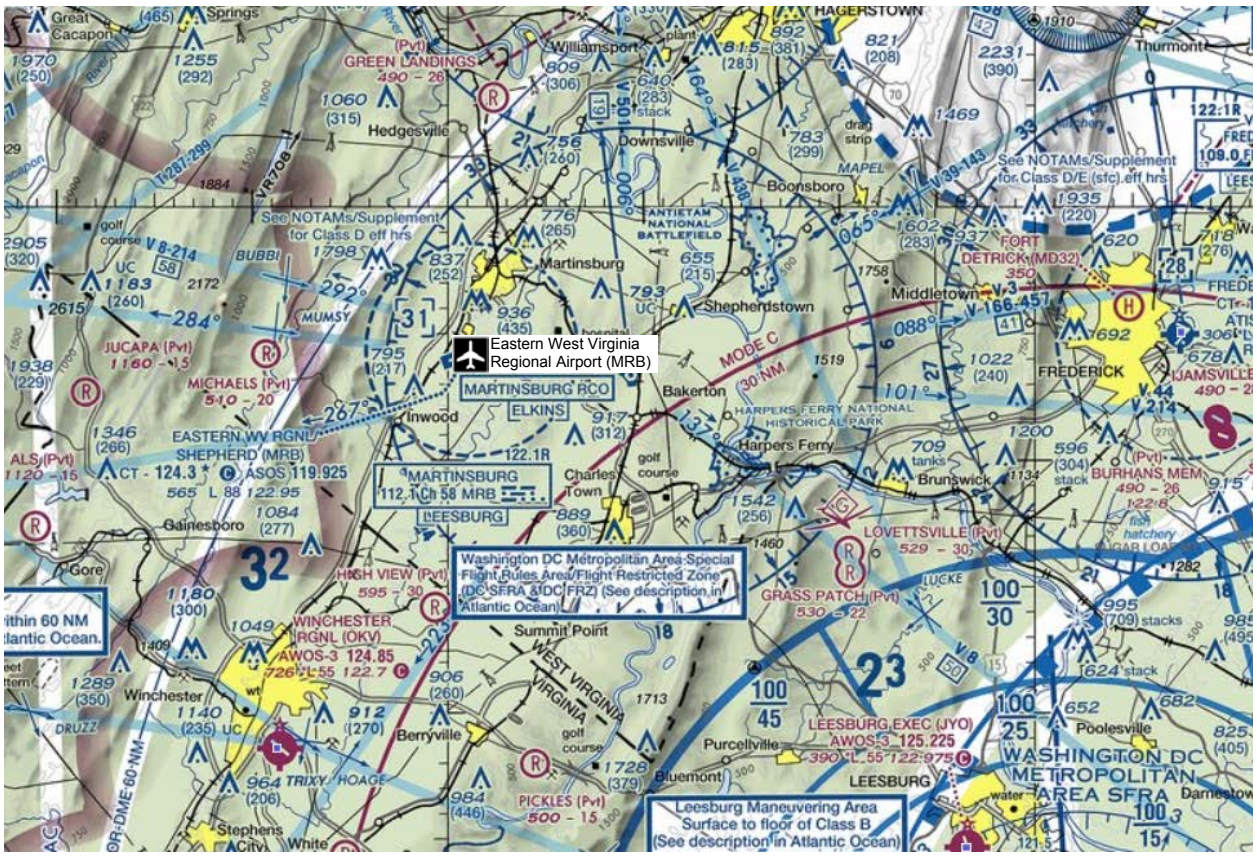


Figure 1.19- VFR Airspace and Air Traffic Control
Source: AirNav, VFRMAP- Digital Aeronautical Charts, Sectionals, January 2017

IFR AIRSPACE AND AIR TRAFFIC CONTROL

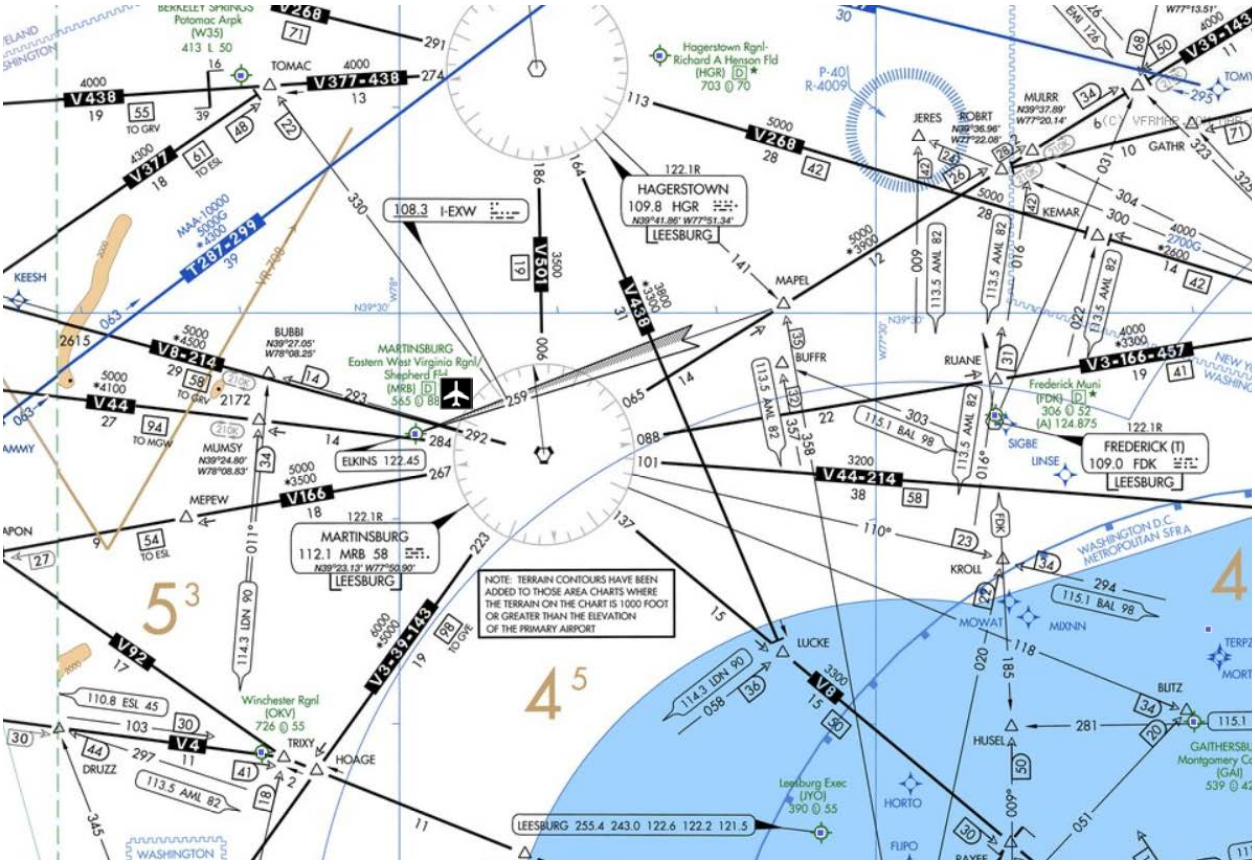


Figure 1.20- Airspace and Air Traffic Control
Source: AirNav, VFRMAP- Digital Aeronautical Charts, Sectionals, January 2017

Image by Delta Airport Consultants, Inc.

Section 4 - Existing Non-Standard and Non-Compliant Conditions

A key objective of any planning project should be to identify non-standard conditions

A key objective of any planning project should be to identify the non-standard conditions that exist on an airport and offer recommendations to achieve compliance with FAA design standards. FAA AC 150/5300-13A, ***Airport Design***, provides design standards for airport geometrical layout, runway and taxiway/taxilane design, and associated elements. The guidance provided by the AC references many other FAA guidance documents for specific applications, and is complemented by 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace.

NON-STANDARD CONDITIONS

There are four major categories of existing Non-Standard Conditions at MRB, which are listed below and depicted in **Figure 1.21**.

There are four objects located within the ROFA for Runway 8-26: two supplemental wind cones, a segment of Novak Drive on the Runway 8 end, and a segment of the airport fence on the Runway 8 end. The ROFA must be kept clear of objects except those which are "fixed by function", such as NAVAIDs, which must then meet certain frangibility requirements. The supplemental wind cones do not have permitted "fixed by function" designation. The service road to the MALSR equipment shelter crosses into the ROFA on the Runway 26 end; however, this is permitted by FAA in order to access the MALSR equipment.

Similarly, there are objects within various taxilane object-free areas (TLOFA) at MRB. A taxilane is the portion of the aircraft parking area (apron) used for the access between taxiways and aircraft parking positions. The OFAs for Taxilanes 1, 2, 3, 4, 5, 6, 7, 8, and 9 do not meet the standard for Group I taxilanes (79 feet).

As noted previously, MRB does not have full controlling interest in the RPZs for either runway end. The FAA requires airport sponsors to control these areas for the safety of people and property on the ground, preferably via fee simple ownership. The Runway 8 RPZ encompasses 48.978 acres, which is the design standard for C-IV runways with approach minimums not lower than ¾ mile. Approximately 24 acres

of the Runway 8 RPZ are located outside of the airport property line. The Runway 26 RPZ encompasses 78.914 acres, which is the design standard for C-IV runways with approach minimums lower than ¾ mile. There is also a Departure RPZ on the Runway 26 end, which is associated with the displaced runway threshold and is encompassed within the larger approach RPZ (see **Figures 1.21**). Approximately 15 ± acres within the Runway 26 Approach RPZ and approximately 2 ± acres in the Runway 26 Departure RPZ are not controlled by the EWVRAA via fee simple. The current Airport Property Map notes that there is approximately 3.39 acres of the Runway 26 RPZ over which the airport may hold an avigation easement; however, the instrument is noted as "out for conveyance."

Another Non-Standard Condition at MRB is the presence of obstructions to the Part 77 approach surfaces of both Runways 8 and 26. According to the FAA Form 5010-1, the controlling obstruction is a group of off-airport trees approximately 1,500 feet from the Runway 26 end, with a height of approximately 45 feet above ground level.

In summary, the existing Non-Standard Conditions at MRB are:

1. A segment of Novak Drive, a public right-of-way, is located in the ROFA;
2. A segment of the airport property fence is located in the ROFA;
3. The Runway 8 Supplemental Wind Cone is located in the ROFA;
4. The Runway 26 Supplemental Wind Cone is located on the edge of the ROFA;
5. Taxilanes 1 through 9 do not meet Group I design standards;
6. The airport does not own full controlling interest in the land within the RPZs on either runway end; and
7. Obstructions penetrate the existing approach surfaces to Runways 8 and 26.

These Non-Standard Conditions are depicted in **Figure 1.21**. Recommendations to address these non-standard conditions are presented in Section 3.1.

NON-COMPLIANT CONDITIONS

FAA Order 5190.6, Airport Compliance Manual, provides guidance on "through-the-fence" (TTF) activities at public-use airports. A TTF agreement grants access to the public landing area by aircraft stored and serviced offsite, on adjacent property. TTF arrangements are generally discouraged by the FAA as they may reduce an airport's ability to meet its federal obligations.

There are four commercial-use TTF operations at MRB, which represent non-compliant conditions. Numbers eight through eleven on **Figure 1.21**:

8. Air Photographics (Building 22);
9. Former Palencar Hangar;
10. Howard Aircraft Maintenance (Building 23); and
11. Eastern Technical Corporation (Groves)-(Building 11).

These four facilities are located outside of airport property (see **Figure 1.21**). Facilities 8 and 10 are north of the runway, and have access to the airfield via an unnamed taxiway. Facilities 9 and 11 are located adjacent to the general aviation apron and have immediate access to the apron.

In reviewing airport records, it appears that Facilities 10 and 11 have existing TTF agreements. Facility 11 also holds an easement filed with Berkeley County which permits access from Aviation Way through the terminal apron. Facilities 8 and 9 do not have formal TTF agreements with the Airport.

Recommendations to address these non-compliant conditions are presented in Section 3.1.

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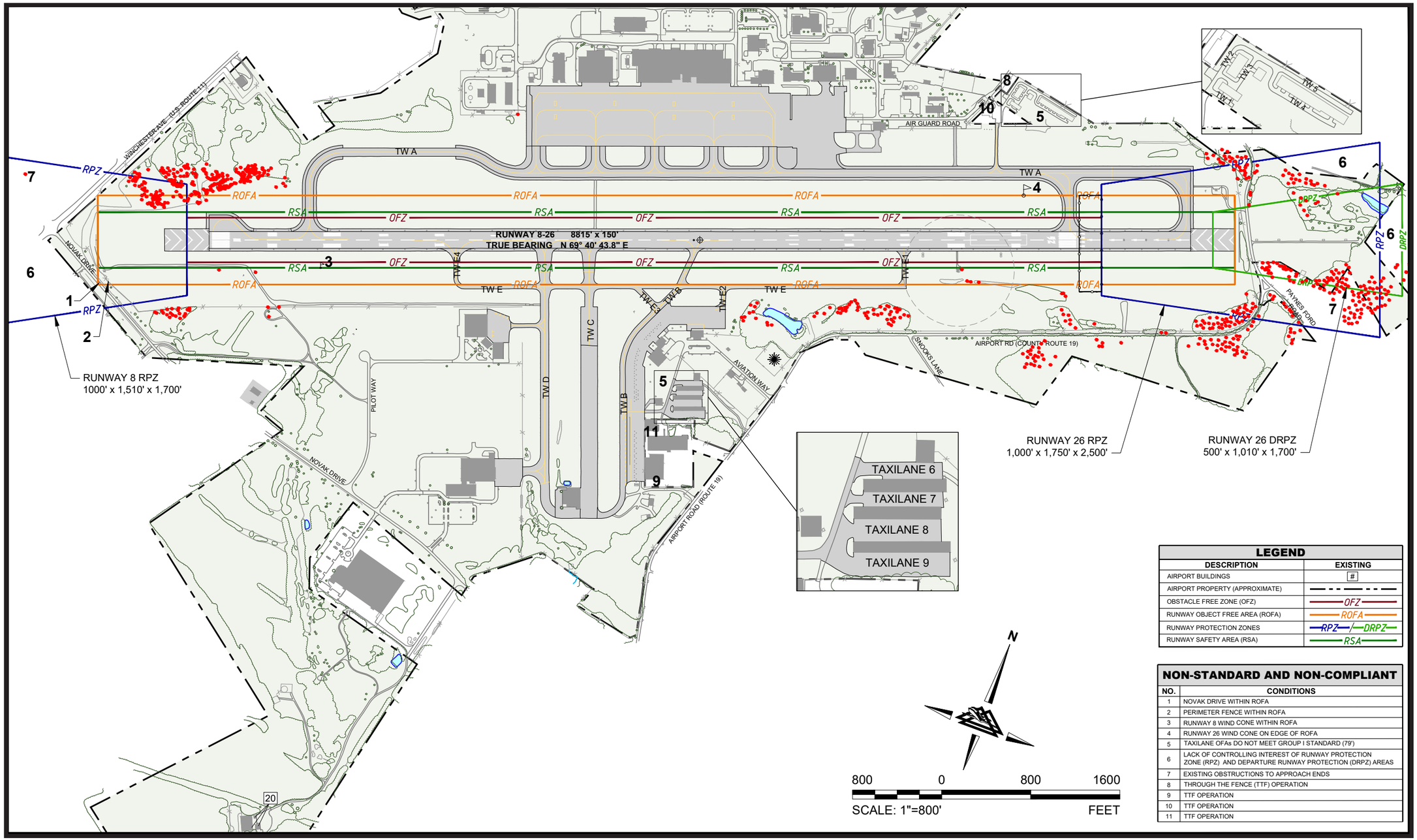
NON-STANDARD AND NON-COMPLIANT CONDITIONS



LEGEND	
DESCRIPTION	EXISTING
AIRPORT BUILDINGS	#
AIRPORT PROPERTY (APPROXIMATE)	
OBSTACLE FREE ZONE (OFZ)	OFZ
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
RUNWAY PROTECTION ZONES	RPZ / DRPZ
RUNWAY SAFETY AREA (RSA)	RSA

NON-STANDARD AND NON-COMPLIANT	
NO.	CONDITIONS
1	NOVAK DRIVE WITHIN ROFA
2	PERIMETER FENCE WITHIN ROFA
3	RUNWAY 8 WIND CONE WITHIN ROFA
4	RUNWAY 26 WIND CONE ON EDGE OF ROFA
5	TAXILANE OFAs DO NOT MEET GROUP I STANDARD (79')
6	LACK OF CONTROLLING INTEREST OF RUNWAY PROTECTION ZONE (RPZ) AND DEPARTURE RUNWAY PROTECTION (DRPZ) AREAS
7	EXISTING OBSTRUCTIONS TO APPROACH ENDS
8	THROUGH THE FENCE (TTF) OPERATION
9	TTF OPERATION
10	TTF OPERATION
11	TTF OPERATION

Figure 1.21- Non-Standard and Non-Compliant Conditions
Source: Delta Airport Consultants, Inc

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